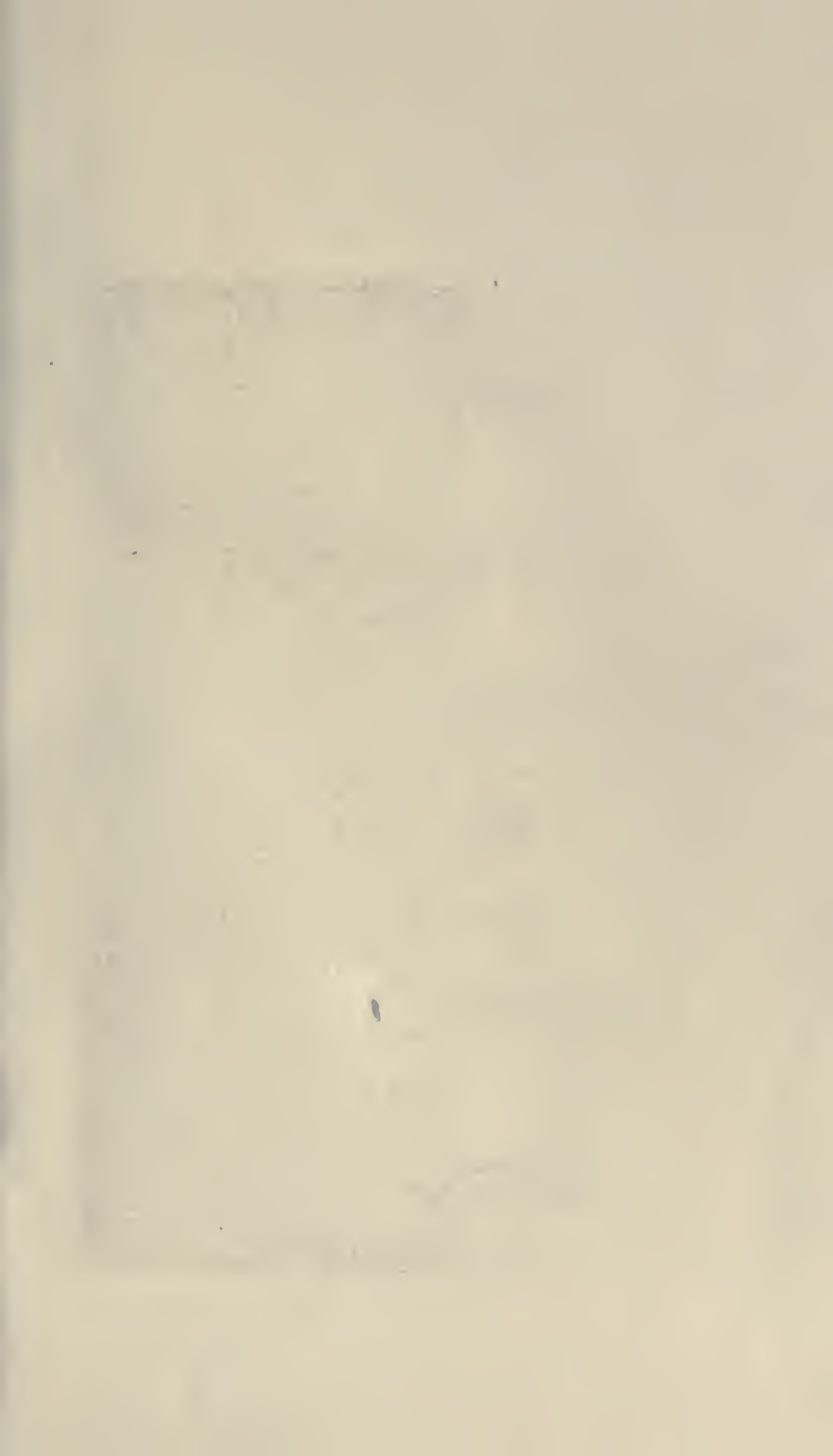


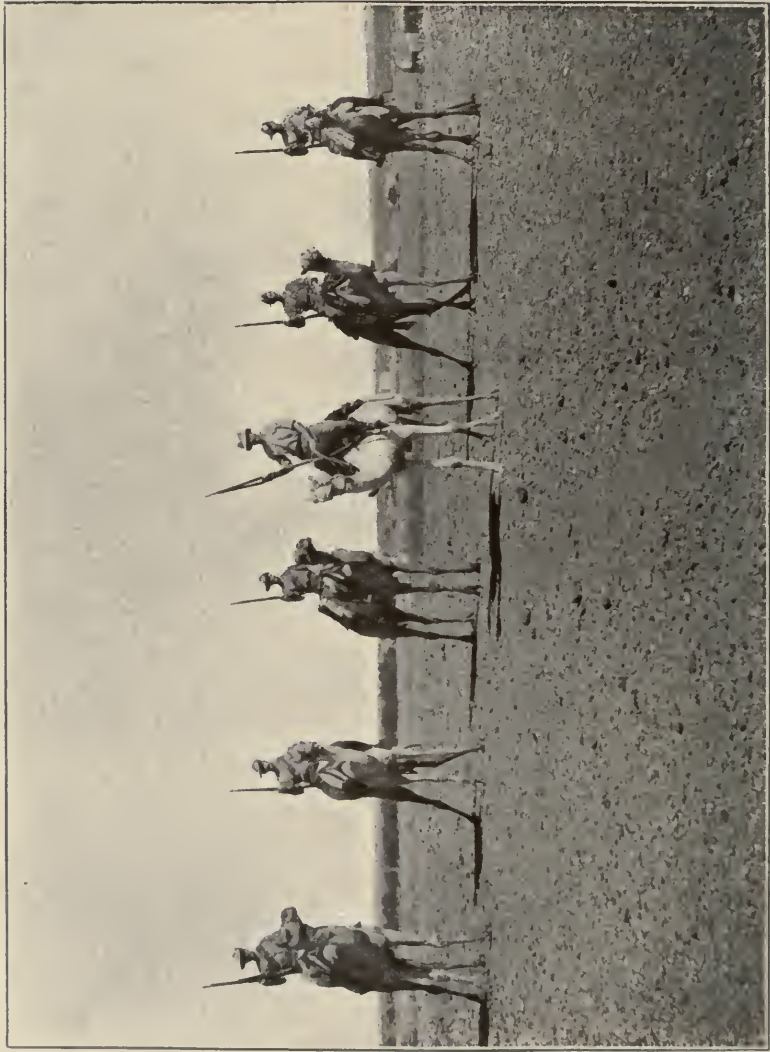
THE
CONQUEST OF
THE DESERT





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THE WATCHERS OF THE DESERT.

The Camel Corps of the Cape Mounted Police patrolling the Kalahari Desert.

THE CONQUEST OF THE DESERT

BY

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Congress*

WITH FIFTY ILLUSTRATIONS

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TO
THE MILLION SETTLERS OF
TO-MORROW
ON THE DRY AND DESERT LANDS
OF SOUTH AFRICA
WELCOME

PREFACE

THIS book has been written for the purpose of calling attention to that wonderful region entitled the Kalahari Desert or "Great Thirst Land." The desert may be roughly divided into two great divisions—the north and the south. The northern portion is at present under the jurisdiction of the Imperial Government, while the southern portion falls within the territory of the Union of South Africa. It is this latter portion and the surrounding country which I am about to describe. This is the most arid portion of the desert, and one of the driest places in the British Empire.

The Conquest of the Desert opens up a vast country eminently suited to colonisation, while it offers to the youth of the Empire a healthful, profitable and fascinating life in a "Land of Eternal Sunshine."

Some of the sketches in this volume have appeared in *The Union Agricultural Journal*, in newspapers and periodicals, and are now collected for publication in a more convenient

Preface

and permanent form. I desire to express my thanks to the Editor of *The Nineteenth Century and After* for permission to republish two articles which appeared in that magazine (see Chapters X., XII. and XIII.), and also to the Editor of *The Graphic* for allowing me to reprint an illustrated account of my journey across the Desert which appeared in that periodical. The substance of each article and the summary of all is that Land Settlement is the most urgent question before the people of South Africa, as well as one of the grandest problems of the age.

LONDON, 30th September 1913.

CONTENTS

CHAPTER	PAGE
I. THE ADVANCE OF THE DESERT . . .	1
II. TO THE ISLANDS OF THE ORANGE . . .	9
III. THE SAND-DUNES OF THE DESERT . . .	19
IV. THE MELON AND THE MAIL . . .	31
V. WHERE TWO EMPIRES MEET . . .	39
VI. THE SHADOW OF THE GREAT THIRST . . .	47
VII. THE VISION OF THE PROPHET . . .	57
VIII. WHAT THE BROWN EARTH GAVE TO THE BLUE	69
IX. THE POOR AND THE LAND	81
X. A RAINLESS WHEAT	93
XI. WHAT THE DIP MEANS TO THE DESERT . . .	121
XII. THE EYE OF KURUMAN	141
XIII. THE CATARACTS OF KING GEORGE . . .	149
XIV. THE LIFE DREAM OF LIVINGSTONE . . .	177
XV. THE EMPTY LAND	189

LIST OF ILLUSTRATIONS

THE WATCHERS OF THE DESERT . . .	<i>Frontispiece</i>
	TO FACE PAGE
THE LONG WHITE ROAD TO THE DESERT . . .	2
A DESERT TREE	4
THE ORANGE RIVER AT UPINGTON (Fig. 1) . . .	10
AN ORANGE GARDEN AT KAKAMAS (Fig. 2) . . .	10
THE UNKNOWN ISLANDS OF THE ORANGE . . .	12
BASTARDS—REMNANTS OF A GREAT NATION (Fig. 1) . . .	14
CONVERTS TO CHRISTIANITY (Fig. 2) . . .	14
A LESSON IN HOUSEHOLD SCIENCE	16
THE HEADQUARTERS OF THE CAPE MOUNTED POLICE (Fig. 1)	20
STARTING OUT FOR THE KALAHARI DESERT (Fig. 2) . . .	20
GERT AT HOME	22
A BUSHMAN ROBBER	24
BUSHMAN GRASS (Fig. 1)	26
A DESERT TREE (Fig. 2)	26
CROSSING A SAND-DUNE	28
BREAKFAST IN THE DESERT	32
HIS MAJESTY'S MAILS	36
THE SPOOR OF A PUFF-ADDER	38
THE PUFF-ADDER	42
AN OUTPOST OF EMPIRE (Fig. 1)	44
DIAMOND DIGGERS AT RIETFontein (Fig. 2) . . .	44
WHERE TWO EMPIRES MEET	46
JACOB, THE DESERT TRACKER	50
DESOLATION—A DESERT PAN.	52

List of Illustrations

	TO FACE PAGE
A LOCUST SWARM	54
ZWART MODDER—SHOWING THE DRY BED OF THE MOLOPO (Fig. 1).	62
A DESERT SCENE (Fig. 2)	62
NIGHT ON A SAND-DUNE (Fig. 1)	66
A BUILDING BOOM (Fig. 2)	66
MAP OF GORDONIA	68
THE DRY FARMER'S GUIDE (Fig. 1).	72
THE EYE OF KURUMAN (Fig. 2)	72
A WIND-BREAK (Fig. 1)	76
DRY-LAND PRODUCTS (Fig. 2)	76
A MISSION HOME (Fig. 1)	84
A SETTLER'S HOME (Fig. 2)	84
THE KAKAMAS IRRIGATION CANAL	86
THE KALAHARI BEAN	88
A RAINLESS WHEAT	110
DRY-FARMING IN BECHUANALAND (Fig. 1)	144
A SCIENTIST WITH A RECORD BEAT (Fig. 2)	144
DAVID LIVINGSTONE	180
MOFFAT'S HOUSE AT KURUMAN (Fig. 1)	182
MISSION INSTITUTE AT KURUMAN (Fig. 2)	182
SOIL EXAMINATION (Fig. 1)	192
SELECTING THE SITE OF A DRY-LAND EXPERIMENT STATION (Fig. 2).	192
A FAMOUS DRY-FARMING REGION (Fig. 1)	194
BORING FOR WATER (Fig. 2)	194
MAP SHOWING THE STEADY ADVANCE OF SETTLERS	196

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THE CONQUEST OF THE DESERT

CHAPTER I

THE ADVANCE OF THE DESERT

“Thou shalt not destroy the trees . . . for the tree of the field is man's life” (Deuteronomy xx. 19).

THE last Romance of Agriculture, the most daring of its many triumphs, is the Conquest of the Desert. Ever since the day when the immortal Pioneer stood on the Mount of Pisgah, looked backward over the bitter waters and forward to the utmost sea, the sons of men have pressed onward to the Promised Land. What is the loadstone that draws the peasant and the peer from shieling or stately home to die a lonely death on the frontiers of civilisation? It may be Commerce or Discovery, the Gospel or the Flag, or perchance a thoughtless woman's wile: these—all these—have brought men to the Never-Never Country, and so the trail is blazed for those who care to

The Conquest of the Desert

follow. For the nameless grave has often been the Valhalla of the brave.

Call up the spirits of these valiant path-hewers and put the question to them : "What would you have us do to commemorate your deathless deeds ? Shall we build noble monuments to your memory, picture galleries, or splendid palaces ? " And from across the ether waves of Eternity comes the answer, clear as a cloister bell :

"To our resting-places bring your sturdy settlers. Fling your railroads across the scorching sands. Fill your sickly, street-bred people with the ozone of our wastes. Men we want—not monuments—to perpetuate the glory of our name."

What is the meaning of the term desert ? The dictionary defines it as "a barren tract incapable of supporting population, as the vast sand plains of Asia and Africa which are destitute of moisture and vegetation." But where will you find a region of this description ? Certainly not in the Kalahari, the Sahara or the Egyptian Desert. And these are the three great deserts of Africa. For our purpose we may think of a desert as a place with less than ten inches of rain in a normal year. But under



THE LONG WHITE ROAD TO THE DESERT.

The intense whiteness of the track is due to surface limestone. Note also the Nun-Grey Vaal-bosch—characteristic of Dry and Desert Lands.

The Advance of the Desert

this definition we must include the pretty village of Prieska, with an annual rainfall of eight inches, in the Cape north-west, and many other spots in South Africa, which may have desert climates, but are certainly not desert places. Therefore, while we understand the meaning of the word desert, it is difficult to define.

The desert is never still. It is always advancing or receding. To make this clear, let us imagine an invisible foe—the Demon of the Desert. He is waging eternal war with us. He does not want men. He wants desolation. He orders out his emissaries of destruction—the hot wind, the noxious weed, the cattle plague, and the drought. He fears only one thing. It is population.

Is the Kalahari Desert advancing or receding? In other words, is the climate of that part of South Africa becoming more or less arid? We turn to *The Journal of the Royal Geographical Society* for the year 1865. In that magazine an able writer, Mr James Fox Wilson, demonstrates beyond all doubt that the Kalahari region is becoming drier. In support of his argument he shows that vast forests of camel-thorn and wild olive have been ruthlessly

The Conquest of the Desert

destroyed, and he sums up the reason for this increasing aridity in the fact that "the natives have for ages been accustomed to burn the plains and to destroy the timber and ancient forests." He urges afforestation as the only way in which to arrest the country from further denudation. Half-a-century has come and gone, and what have we done? The white man has joined hands with the native vandal, and year after year the work of ceaseless destruction goes on. Not a single tree is ever planted. Day by day the desert zone is advancing. Fountains are rapidly diminishing, rivers are drying up, and life for both man and beast is becoming more relentless and more severe.

But why should we vex ourselves about the desert, some may say. It is nothing to us. In our province we have no desert. That is wrong. The conquest of the Kalahari Desert is of vital importance to every farmer in South Africa.

The other day we stood on the Government Dry Land Experimental Station at Lichtenburg in the Transvaal. Suddenly a burning wind swept over our wheat lands. It was the desert wind. Hardly a tree to stop it for 200 miles. Where, then, did it go? Perhaps



A DESERT TREE.

Splendid forests of those Camel-thorn trees have been ruthlessly destroyed. The desert climate is ever advancing, and droughts are becoming more frequent and more severe throughout South Africa as the result of the destruction of these natural forests.

The Advance of the Desert

some Free State farmer can tell ! But, besides the Kalahari, each part of the union has its own desert or dry lands. For every vacant erf¹ is a tiny wilderness ; every treeless farm a little desert.

Is it possible, then, the reader may ask, to check the advance of the desert, conquer the crop-blighting winds of aridity, and ameliorate the climatic conditions of a vast country such as the Kalahari ? Yes ; but three things are essential — Population, Conservation and Afforestation.

The great droughts of the world are most frequent, not in the well-peopled centres, but in the wilderness and the solitary place. South Africa is paralysed by her huge farms² and her vast, vacant spaces. How shall we conquer drought ?—for, assuredly, it will come again. There is but one remedy. Plant more people on your desolate lands, and then you will cease to fear drought.

In a speech recently delivered in London, an Australian premier remarked that Population was merely another term for Patriotism, meaning thereby that everyone who had the highest

¹ Erf = A garden plot—usually about half-an-acre.

² The size of average farm in the Transvaal is 5000 acres.

The Conquest of the Desert

interests of the Commonwealth at heart must labour earnestly and ceaselessly to fill up her empty spaces with a sturdy race of British emigrants. The same might be said with equal truth of South Africa.

.
By the term Conservation I mean the storage of soil moisture by deep ploughing and thorough cultivation. Think of the millions of tons of water which might be retained in the ground for a year or more if the mile-long desert pans¹ were ploughed and planted. Then would come the Conservation of winter fodder by means of ensilage.

Lastly, Afforestation. In the desert the gigantic wave-like sand-dunes are for ever moving slowly, shifting hither and thither, throwing out long, restless tongues of burning, wind-blown sand which, year by year, cover up large tracts of deep, rich, silty soil in river-bed or fertile plain. It is lamentable to see the rapid destruction of magnificent tracts of land by soil erosion all over South Africa. Huge dongas, like the Bad Lands of North Dakota, are already in process of formation. This can only be checked by a systematic scheme

¹ A dried-up depression usually brakish.

The Advance of the Desert

of Afforestation. For by trees we shall be able to fling back the desert zone till the gushing waters of the Eye of Kuruman will once more seek the dark cañons of the "Great River" ¹ and sweep outwards to the delta at the sea.

The Kalahari offers an admirable field for agricultural exploration. Take for example the vegetation of the desert. Here you find plants which have been growing for ages upon a limited rainfall. Think of the excellent drought-resistant qualities which they must have developed. Such plants are of special value to the dry farmer. In this connection we may single out the bushman grass. During some years this hardy plant does not receive four inches of rain. Yet it grows and seeds, and cattle get fat upon it. Then take the wonderful tsamma melon, well called the life-blood of the desert, which thrives merrily on a scorching sand-dune. Can any dry land be too dry for it? And then the dainty desert flowers: crimson and purple, and purest snow, fit to adorn an English queen. Pass from the subject of economic plants to the question of pure science. What a rich field of discovery awaits the patient investigator! We crossed

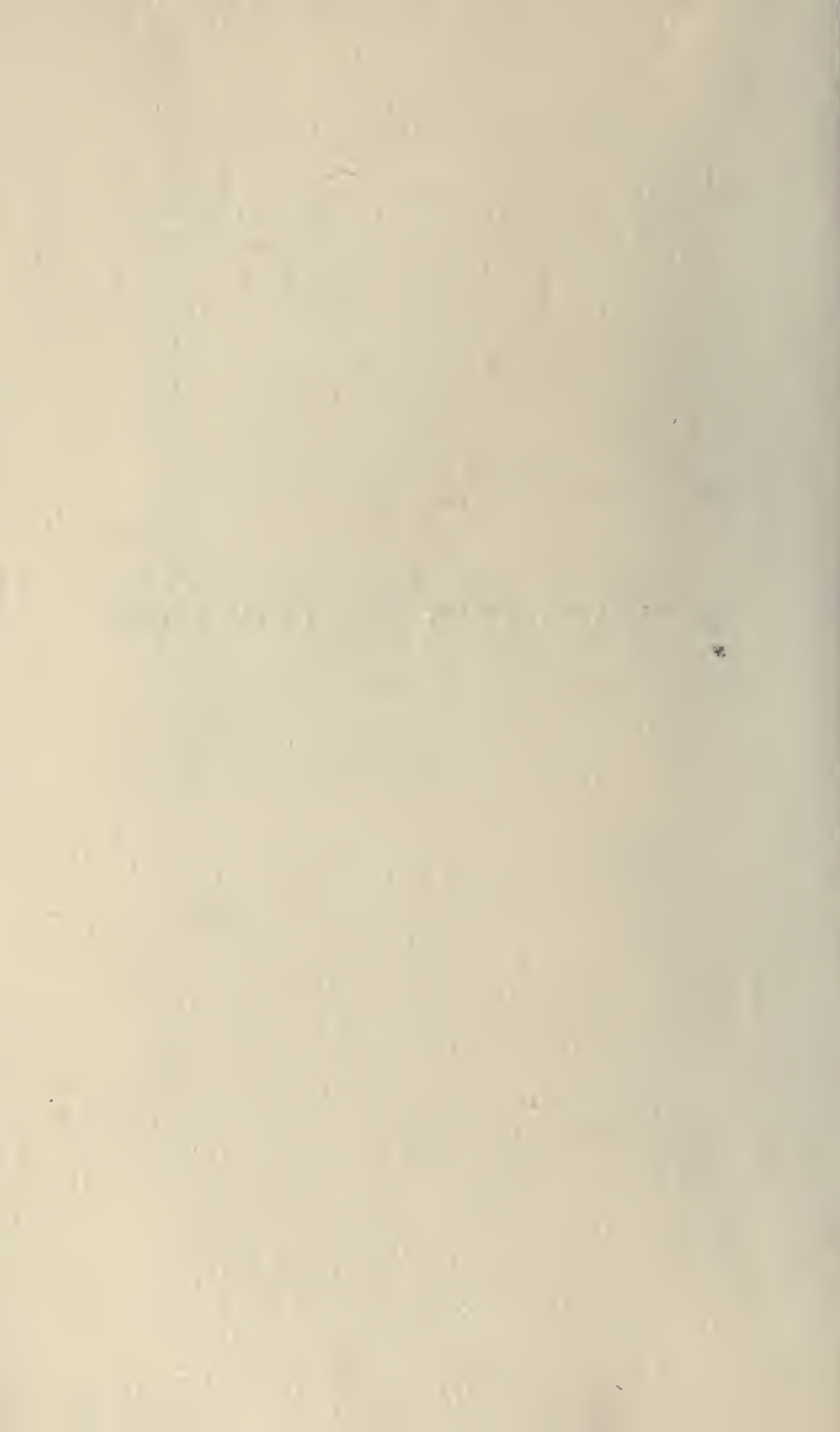
¹ See Chapters XII. and XIII.

The Conquest of the Desert

a dazzling road of shells. It cut to the heart to crunch under foot those pretty fossils as we pushed forward over the sand-dunes. And then the climate ! We do not suppose that any place in all the world has more hours of sunshine than the Kalahari. How many delicate lives might be saved by a course of desert treatment, and what a work lies open to the settler in the development of those sunlit lands !

And what of the future ? It belongs to the dry farmer. He is settling on those desolate plains. No disaster can break his spirit. No drought can wither the fruits of his tireless industry. A new man has arisen—worthy, indeed, of the New Agriculture.

TO THE ISLANDS OF THE ORANGE





(FIG. 1.)

THE ORANGE RIVER AT UPINGTON.

A majestic River with Islands of wild olive and willow.



(FIG. 2.)

AN ORANGE GARDEN AT KAKAMAS.

The valley of the Orange River will soon be known as one of the grandest citrus centres in the world.

CHAPTER II

TO THE ISLANDS OF THE ORANGE

How few can tell any more than the mere name of this mighty river! How little the farmer dreams that her verdant valley-bed holds the richest land in Africa! How strange that no railroad builder forestalls that chainless rush of the human tide which ere long must sweep westward by her splendid, shortest pathway to the sea.

The best place from which to view the Islands of the Orange is at Upington, the capital of Gordonia. It is quite out of the world, being 120 miles from the nearest railway, and that only a branch line to Prieska. Its history is lost in antiquity. The story runs that years ago it was honoured by a visit from the Cape Attorney-General, Sir Thomas Upington, and the Prime Minister, Sir Gordon Sprigg. And these two genial knights left—not their spurs on the table as in the old Border tale—but their names on the map to commemorate their visit. We are glad Sir Gordon

The Conquest of the Desert

did not suggest his homely surname, for we fear it might have hampered the progress of the country. But Gordonia is a pleasing name—most people associate it with the hero of Khartoum—and Upington has a ring of real dignity. And so this immense and desolate region was duly christened and then forgotten. Since then, these lost tribes will tell you, in slow and solemn tones, no Cabinet Minister has ever deigned to set foot in their dorp or district. Yet the simple facts are these : Here is a progressive and highly intelligent community possessing a river frontage fringing the finest orange lands in the world, backed by a truly magnificent ranching country stretching northward for four hundred miles—the largest, richest and grandest district in the Cape province paralysed and perishing for lack of a railway !

.

The Civil Commissioner for the District of Gordonia, who also holds the title of Resident Magistrate, is Mr Daniel May. To this courteous and scholarly official I am indebted for much valuable information about this little-known region. The second son of the late Staff-Commander May, R.N., the present chief citizen of Upington was born in the fair county



THE UNKNOWN ISLANDS OF THE ORANGE.

The first white man on Sunday Island. (Mr. Lennard Strickland, Cape Mounted Police.)

To the Islands of the Orange

of Devon. At the age of one he emigrated to South Africa, and at seventeen entered the Civil Service of the Cape. His eldest brother, Mr Barry May, is the present Imperial Secretary for the Bechuanaland Protectorate ; and so it is of interest to note that the vast territories of the two brothers are separated, not by the thin chalk-line across the kitchen floor, as in Stevenson's story of the quarrelsome sisters, but by the broad dry bed of the Molopo River.

The district of Gordonia is the largest in the Cape Province. It has an area of 18,499 square miles, more than two-thirds of which is unsurveyed waterless desert—the southern portion of the great Kalahari Desert. This part of the district is inhabited by roving bands of semi-savage natives who live on the tsamma melon, extracting the water from it for drinking purposes, and grinding the pips to make a sort of coffee. The southern boundary of the district is the Orange River, on which there is a frontage, as it may be called, of 200 miles. This frontage is occupied by a series of long narrow farms, averaging a breadth of three miles on the river and stretching northwards back from the river for a distance of fifteen to eighteen miles. They were originally laid out,

The Conquest of the Desert

I believe, on the basis of half-an-hour's ride along the river and two and a half hours' ride away from the river into the "back country." Between these river farms and the actual desert there is a considerable area surveyed into large farms, varying in size from 5000 to 50,000 morgen. Topographically, the district consists of a vast undulating plain, with mountainous regions at the south-west and south-east corners. The only feature of any distinction is the valley of the Molopo River.

This river, by the way, is now non-existent, and, I am informed, the last occasion on which water flowed in the bed was in 1894. In that year the water did not reach the Orange River, but, diverted by sand-dunes which had been blown across its course, poured itself to the west and was lost in the sand. At one time, however, the river must have been an important stream, and it has cut a considerable valley in the hard quartzites of the Zwart Modder series. The most remarkable feature of the district is the presence of sand-dunes. Beginning on the banks of the Orange River, they may be seen in even greater extent as one travels northward, till they occupy the entire country and form the desert itself. The sand is generally of a



(FIG. 1.)

BASTARDS—REMNANTS OF A GREAT NATION USED AS A
BUFFER STATE AGAINST THE BUSHMEN.



(FIG. 2.)

CONVERTS TO CHRISTIANITY AT A BORDER MISSION STATION.

To the Islands of the Orange

dark red colour, and these vermilion ridges, wind-blown into crests and curves, are a wonderful and unforgettable feature of the landscape. Transport over such country, where the road seeks out the easiest path over such mountains of sand, is extremely difficult. In many places it is quite impossible to believe a waggon capable of being dragged over the sand, unless it is actually witnessed. The surveyed farms are occupied chiefly by Europeans. The coloured people of the district do not differ materially from those found in other districts, though the racial characteristics of the Bushman and Hottentot are more marked in the general type than elsewhere. Few, if any, pure specimens of these aboriginal races now exist; though the desert-dwellers resemble them, and still live in a state of semi-savagery. The coloured people are the "hewers of wood and drawers of water."

.
In addition to the Europeans and coloured folk there exists a race which is met with in no other part of the country, and which merits special mention. The persons belonging to this class are locally known as "Bastards." The early European pioneers married coloured

The Conquest of the Desert

women—in fact, it is said that under a former regime such a union was made a condition of a grant of land. The result of these marriages has been the creation of a class of person, coloured, but of a very much higher moral and intellectual development than is usually found. In the past they owned most of the land and administered their own affairs, through magistrates and field-cornets chosen from amongst themselves. Several persons of the older generations of these Bastards are still living on their own land, and are justly respected and admired by their European neighbours, who, however, do not fail to recognise the taint of coloured blood. The younger generation have not followed in the footsteps of their fathers, and the type has much degenerated. The main cause has probably been in the introduction of liquor. The great majority of farms, formerly held by them, have passed, as the price of their downfall, into the hands of Europeans.

Upington is a strangely English town. The magistrate was born in England, so was the mayor, so was the chief of the mounted police, while the leading merchant is of English descent. A handsome Dutch church stands out like a beacon of light to guide the weary traveller



A LESSON IN HOUSEHOLD SCIENCE.

Take the core of a peach-stone. Put it into a bottle of Orange River water. In five minutes it is clear and sweet, and fit to drink.

To the Islands of the Orange

toiling through the torrid sand. And here, we are told, a noble-hearted Predikant preaches to all comers in the Dutch and English tongues. But where are these Little People—Conies of Empire—the Scots? Surely their absence from a community of this size calls for immediate investigation by a Royal Commission!

Upington occupies a picturesque and commanding site on the north bank of the Orange River. Be here at sunrise and return at sunset. A background of purple mountains, a river sailing in silver, or mirrored in gold, islands of wild olive and willow, and far away the flaming desert sand, and far above the blue eternal sky.

THE SAND-DUNES OF THE
DESERT



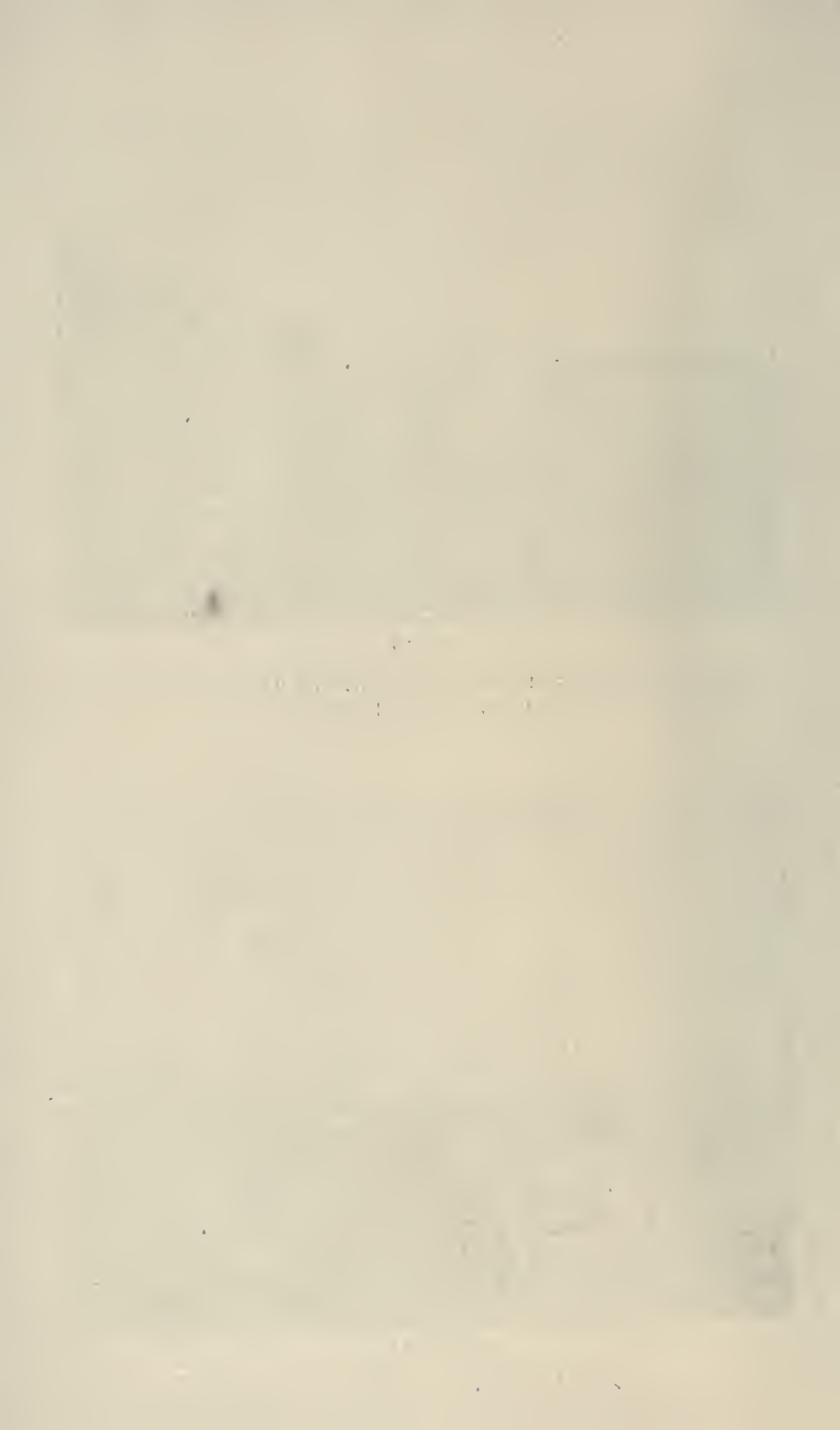
(FIG. 1.)

THE HEADQUARTERS OF THE CAPE MOUNTED POLICE AT UPINGTON.
(Captain Bridge and family.)



(FIG. 2.)

STARTING OUT FOR THE KALAHARI DESERT.



CHAPTER III

THE SAND-DUNES OF THE DESERT

It was my good fortune a short time ago to take a journey along the southern border of the Kalahari Desert, across that immense tract of country which is now known as the district of Gordonia. And in order that readers may form a true picture in their own minds of this little-known portion of the Union of South Africa, I think it best to give them my diary just as I wrote it on the spot, feeling sure that they will pardon any lack of style for the sake of the simplicity of a traveller's notebook. I hope that my diary may prove of some use as a guide and time-table to all who have to traverse this desolate region. There is an urgent need of a desert handbook. Not a single season passes but some brave life is lost on the sand-dunes of the desert. In this chapter I shall describe my journey from Upington, on the Orange River, to Rietfontein, on the German border. My fellow-trekkers consisted of three men and six mules, each of whom deserves honourable mention in the desert "Who's Who."

The Conquest of the Desert

Chief of the party was Captain William S. Bridge, commanding the "S" Division of the Cape Mounted Police. His bear comprises the whole of Gordonia, a part of Kenhardt, and a portion of Namaqualand, or, roughly, 36,000 square miles. In other words, it is much larger than the whole of Scotland. Inspector Bridge is responsible for the law and order of this vast area. He is also the warden of the game reserve of the Southern Kalahari. His headquarters are at Upington, with sub-stations at the following points:—(1) Ramon's Drift, (2) Pella, (3) Puff-Adder, (4) Scuit Drift, (5) Kakamas, (6) Keimoes, (7) Zwart Kop, (8) Zwart Modder, (9) Warm Vlei, (10) Obobogorop, (11) Witdraai, and (12) Rietfontein. Born in the fair county of Devon, Captain Bridge has spent thirty years of his life in the Cape Mounted Police. He is still in the prime of his manhood—lion-hearted, proud of his magnificent corps, and as much at home in the centre of the Kalahari as he is in Piccadilly Circus—an Empire builder.

His two native boys are named respectively William and Jacob. They are the best "Bastards" in the whole country. The former, a private in the C.M.R., is the son of a desert patriarch called Gert Louw. I took a



GERT AT HOME (WITH HIS BUSHMAN BOW AND ARROWS, COOKING POT, AND TSAMMA MELONS).
The most famous Hunter in the Kalahari. Age 100. Shook hands with Queen Victoria.
Taken to London by the traveller, Farini (1885).

The Sand-Dunes of the Desert

photograph of Gert beside his hut. He is one hundred years of age, and is probably the only coloured man now alive who has had the honour of shaking hands with the late Queen Victoria. I showed Gert his photograph in Farini's book, entitled "Through the Kalahari Desert" (page 97)—a photograph taken in 1885—and he was immensely pleased. Farini took Gert home to England, and it was there that he met the Queen. Gert said that you could put the whole of Upington into one house in London, that the people were like the locusts for multitude, and that he greatly missed the desert sand-dunes in the city!

William is the finest tracker in the Kalahari. Put him on the spoor of a man or a horse, a snake or a wild cat—it is all the same. He will knock the sleeping wild cat on the head, trace the lost traveller to the thorn bush on the sand-dune, or summon the flying criminal to surrender in the King's name.

And Jacob, the other Bastard Hottentot—what a toiler! always working from dawn far into the night! If work counts for anything in the Land of the Hereafter, then Jacob will surely have a high place. His pedigree is somewhat obscure. He also is a child of the sand-

The Conquest of the Desert

dunes—an unveiler of the secrets of the spoor. He told us at nine o'clock in the morning what we should meet at four in the afternoon of the same day—namely, three policemen, a pack-horse, and a Bushman robber. At four-thirty P.M. we overtake and photograph the convoy. His prophecy is correct. He has read the riddle of the sand, and, Daniel-like, has rendered the true interpretation thereof. I stand in silent wonder before this seer of the sand-dunes. But if only Jacob could be entered for the Marathon race! How he would laugh for sheer joy! For what is a run of 100 miles to him, by day or night, with the suck of a tsamma melon!

And those six dumb animals—do they not also merit a page in my book of travel? Snug in my corner, sheltered from the blazing sun, I used to watch them, hour after hour, toiling up those terrible dunes. Jacob ran by their side, with friendly words of encouragement, but never once did he use his short, stinging whip. For it is the Captain's order that no mule of his must ever be whipped during the passage of the dunes. So Jacob trotted and shouted, and cracked his whip like a pistol shot; while William, perched above, swirled his long lash



A BUSHMAN ROBBER CAPTURED IN THE DESERT BY THE MOUNTED POLICE.

The Sand-Dunes of the Desert

till the air around us was a rushing wind, but no stroke ever struck that wonderful team of six. Tell me what you think of it ! Six mules, after three hard days of travel, so eager to gain the top of these mountains of sand that in the midst of a steep ascent they start to trot with the sand up to the hub of the wheels, and the Cape cart creaking like a Highlander's best Sunday boots. Let me give you the names of the noble six. The two leaders were Klein Boy and Flock Bok ; then came Donder Bok and Bush Bok ; and, last of all, the two wheelers, Wit Boy and Simon. I have travelled in many countries, but in none have I seen such cruelty meted out to the dumb creation as I have witnessed in South Africa. Why break the spirit of your animals with the senseless lash ? Why not try a course of the Captain's sand-dune cure ?

.

DAYS FROM A DIARY

Tuesday, 7th May.—We left Upington at 1.45 A.M. First outspan on the commonage—a huge tract of municipal land very suitable for dry-farming experiments and co-operative small holdings under the auspices of the Town

The Conquest of the Desert

Council. Limestone outcrops recall what Hilgard says: "A lime-country is a rich country." Now journeying through heavy sand. Sir Walter Hely-Hutchinson used to remark when travelling in the north-west: "Bad roads, good farms; good roads, bad farms." Here we traverse a vast stretch of waving Bushman grass like corn white unto the harvest. This must be the finest drought-resistant grass in the world. Think of it! Found extensively all over Namaqualand, Kenhardt and Gordonia, the driest districts in Africa. M. Celliers, a French priest of the Pella Mission, told me that he had registered $2\frac{1}{2}$ in. of rain one year at that station. We may say that this grass thrives on a 3 in. to 10 in. rainfall. Bushman grass grows in tufts, and seems to be easily injured by too close grazing or overstocking. There are two sorts—one with a long, lank growth; the other with a short, slender stem. Every dry farmer should procure some seed from the desert and test the carrying capacity of this wonderful grass. At sunset it is a sea of silver in a crown of gold.

Our next outspan was at Areachap, where there was water, and our last at Geluck, at 5.45 P.M. Many travellers make the mistake



(FIG. 1.)

BUSHMAN GRASS. THE BEST DROUGHT RESISTANT GRASS IN THE WORLD.



(FIG. 2.)

A DESERT TREE.

(The Kokerboom—*Aloe dichotoma*.)

The Sand-Dunes of the Desert

of going on until it is quite dark, thereby tiring their animals and floundering about in the blackness of night. It is far better to give the animals a good feed, set out your sleeping kit, and sit down to a well-cooked supper while there is yet light. The day has been warm, with a cool wind. Night fell calm and serene.

Wednesday, 8th May.—Sunrise at 7.10 A.M. We started a few minutes later, and reached Steenkamps Puts (owner, Christian Leibenberg) at 9.30 A.M. Here we spent an hour. A splendid vlei of about three miles in extent. Beautiful soil, brakish, moist and green with ganna bush. What a chance for a few enterprising lads in the near neighbourhood to put the whole of this land under corn! Lucerne, also, can withstand a fair amount of brak; but if the underground water comes too close to the surface it will soon show signs of wet feet and take on a yellowish tinge. In speaking of the brak, I mentioned that sugar beets were exceptionally tolerant of brak.

“Well,” said a farmer, “I did not know that; but I have grown excellent crops of beets on brak land.”

At 11 A.M. we outspanned for breakfast near

The Conquest of the Desert

Blaauwbosch—so called from a tree which is widely distributed over this desert country. It grows on the summit of the hottest sand-dunes. Here I took a photograph of a curious granite rock, which we named "The Little Sphinx." Then we returned to the Cape cart to enjoy a savoury desert stew for which the captain is justly renowned to the uttermost parts of the Kalahari.

Starting once more, we passed Grond News, and noted a well-marked and verdant aar.¹ At 2.45 P.M. we outspanned for half-an-hour to give the mules a bite of bush and a mouthful of grass. It was a pleasure to see them all rolling so gratefully in the sand. A prosperous farmer (Dirk Coetzee) owns this property, and we were gladdened by the sight of two orange-trees planted beside the house. What a marvellous transformation tree-planting would effect in this desolate region ! An hour later we reached Koegoe Koep, which contains the best water in the district. The meaning of this word is the "Place of the Big Trees." Here we found a dry tributary running into the still drier Molopo. It seems strange that no word has been invented to define a dry river. It was here that we had

¹ Vein of underground water.



CROSSING A SAND DUNE WITH SIX MULES AND A CAPE CART.

The Sand-Dunes of the Desert

the first taste of a Kalahari sand-dune. At Middle Pits we came across some Hottentots living under a bush. Soon we entered a remarkable natural basin with terraced ground like the famous "parallel roads" of Glen Roy, in the west of Scotland, evidently due to the subsidence of lake water to lower levels. Circling the ancient lake-bed we passed into the Molopo, beacons by a huge hill, which we called "Cone Kop." At Cone Kop the Molopo turns abruptly southwards and flows into the Orange River just below the Cataracts of King George. A clump of handsome camel-thorn trees, growing luxuriantly in the bottom of the dry bed of the Molopo, forms another landmark. Just after sunset we arrived thankfully at Zwart Modder (Black Mud), and were glad to put up for the night in the comfortable winkel¹ of Mr Harris.

.
Thursday, 9th May. This morning I spent some time in studying a remarkable invasion of a sand-dune which had flowed like a huge lava stream across the bed of the Molopo. The bright red of the dune and the grey salt soil of the river-bed made a striking contrast. We left Zwart Modder at half-past ten on a bright and

¹ Small store.

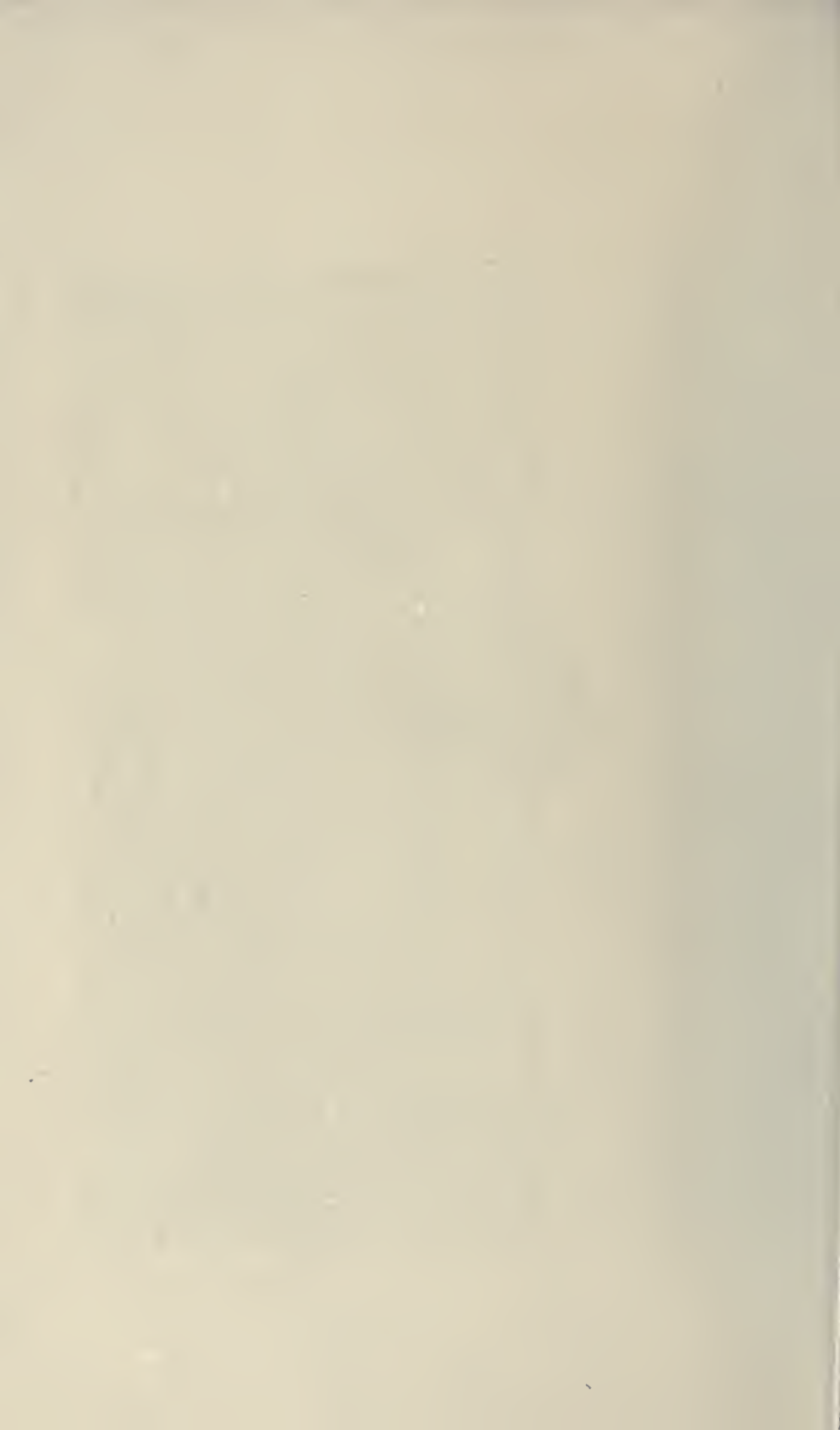
The Conquest of the Desert

lovely day. By noon we had reached Zout Puts. Still struggling in the heavy sand of the Molopo, crossing sand-dunes. Vegetation : driedoorn and bushman grass. Arrived at the farm Bloemfontein (Goldberg). Kindly entertained. Stopped for an hour, and then pressed on again till we struck a pan with water. Here a farmer was busy ploughing and sowing corn around the edge. As the water dries up, more land is ploughed, until the whole dry pan is planted with wheat. In such rich and moist land it is expected that the corn will grow and ripen without a single drop of rain. This is surely the severest test of dry farming, and opens up limitless possibilities for a rainless durum wheat. Observed ganna bush around the borders of the pan—evidently a sign of good dry land soil. Pushed on, and rejoiced in a fine hard road, till we struck the first of Abeam's mighty sand-dunes. Then Jacob, our desert " whip," passed the time picking up broken yoke-keys, hundreds of which are to be found lying by the track-side—the toll demanded by the demons of those terrible dunes. Sunset and outspan in the dunes.

THE MELON AND THE MAIL



BREAKFAST IN THE DESERT.



CHAPTER IV

THE MELON AND THE MAIL

DAYS FROM A DIARY (*continued*)

Friday, 10th May.—Started before sunrise. Here we saw the first tsamma melon growing bravely in the sterile sand. The first question put by the traveller who proposes to cross the Kalahari Desert is not “Can I obtain water?” but “Can I obtain tsamma?” With tsamma he is safe; without it he may die. And so important is this economic plant in the conquest of the desert that it is of interest to recall what Livingstone wrote as he was crossing the Kalahari in 1849:

“But the most surprising plant of the desert is the water-melon, Kengwe or Keme (*Cucumis caffer*). When more than the usual quantity of rain falls, vast tracts of the country are literally covered with these melons. This happens every ten or eleven years. Then animals of every sort, including man, rejoice in

The Conquest of the Desert

the rich supply. The elephant, true lord of the forest, and the different species of rhinoceros revel in the fruit, although naturally so diverse in their choice of pasture. The various kinds of antelopes feed on them with avidity, and lions, hyenas, jackals and mice all seem to appreciate the common blessing. These melons are not, however, all eatable, some being sweet and others bitter. The natives select them by striking them with a hatchet and applying the tongue to the gashes. This peculiarity of one species of plants bearing both sweet and bitter fruits occurs also in a cucumber. It is about four inches long, and about an inch and a half in diameter, and is of a bright scarlet colour when ripe. Even melons in a garden may be made bitter by a few bitter Kengwe in the vicinity, for the bees convey the pollen from one to the other" ("Missionary Travels," page 35).

.
Another testimony to the value of the tsamma, or wild water-melon, appears in a volume entitled "Through the Kalahari Desert," by G. A. Farini, who travelled from the Orange River to Lake Ngami in 1885. Farini writes :
" We gathered some of the largest sama, and

The Melon and the Mail

cooked them. They tasted to me like vegetable marrow, which they closely resembled in appearance ; and seeing how popular pumkins and squashes are in America, it struck me as strange that no one had ever thought of taking some of the seeds and trying them in the sandy wastes of the States." A little further on we find that Farini has had too much tsamma (page 179): " We were all getting tired of the everlasting flavour of sama. We ate sama raw ; we ate sama fried ; we drank sama water ; we made our coffee with sama water ; we stewed our meat in sama water ; and altogether we were sick of the taste of the stuff."

Five years ago an interesting report was presented to the Cape Parliament on the Rietfontein Area. Rietfontein lies 510 miles to the west of Johannesburg, and two miles from the border of German South-West Africa. In his report for 1908 the Assistant Resident Magistrate, Mr J. F. Herbst, speaks of this wonderful water-melon : " Pride of place must, of course, be given to the tsamma, the very life-blood of the Kalahari, without which it would be an absolute desert, closed to man. The fruit in its raw state is chiefly remarkable for its thirst-quenching properties, but cooked it is

The Conquest of the Desert

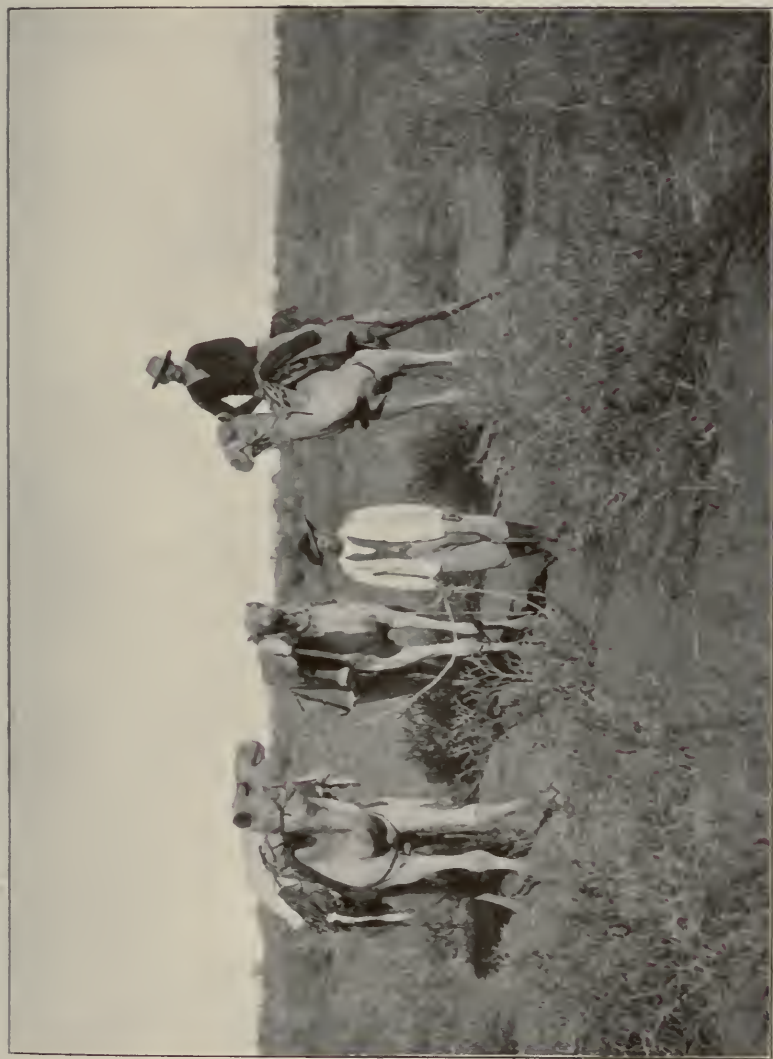
also a food for man. The bushmen have various ways of dealing with it, eating it as a fruit, roasting it under ashes, or stewing it with game or vermin (jackals, wild cats, etc.). The seeds are oily and very fattening. They are ground between two stones and made into flour. As a food, the tsamma is, however, not very strengthening, and cattle fed thereon soon lose their flesh when worked. To fatten cattle quickly it has no equal, and it was a common trick during the recent war in German South-West Africa, where slaughter stock was purchased by weight, to put lean cattle on the tsamma for a few weeks before handing them over."

Surely few can contemplate this extraordinary provision of Nature that enables the traveller to cross the burning sand-dunes of the desert by the trail of the water-melon without remembering the words of the Psalmist :

"And His hands prepared the dry land."

.

A little later we came across a mountain range of dunes destitute of any sign of vegetation. Then in the dim morning light loomed out the Desert Camel Post coming towards us. We stopped for a few minutes to exchange



HIS MAJESTY'S MAILS—THE DESERT CAMEL POST.

The Melon and the Mail

greetings, and to hear the latest news from the "Farthest North." The Desert Post comprised a man, a boy, and three camels—two riding and one pack-camel. The man in charge of his Majesty's mails—Orrin by name—had his left arm crushed by the bite of a savage camel. Nevertheless, he still loves these weird beasts, and runs to time between Zwart Modder and Rietfontein with the regularity of a Union Castle liner. Outspanned for breakfast near Moutons Puts, by a pool of water. Here we shot some Namaqualand partridges, which made a dainty meal. Now on a splendid hard road. At noon we were close to the Kalahari Game Reserve, and the long white sand-dunes of the desert. It is interesting to note that the colour of the dunes varies from a bright red, through orange, to white. Not far away were some wild ostriches.

Our next outspan was at an old store (Rachtenbach), which a new and enterprising tenant was having renovated. It was now fiercely hot, and I longed for the shade of a solitary tree. The name of the farm is Witkop, doubtless so called from the extensive deposits of limestone in the vicinity. On examining some limestone, which was being used for building,

The Conquest of the Desert

I found it full of fresh-water shells. Land here is very cheap, and sells for about two shillings per morgen.¹ The other day the farms of Witkop and Springbok Vlei, comprising 63,000 morgen, were sold for £5500.

¹ $2\frac{1}{9}$ acres.



THE SPOOR OF A PUFF-ADDER ON THE SAND.

WHERE TWO EMPIRES MEET

CHAPTER V

WHERE TWO EMPIRES MEET

DAYS FROM A DIARY (*continued*)

It is curious to find that German money is the commoner currency in this part of the Union. Mealies (maize) are 30s. a bag. Witkop is twelve hours from Rietfontein, and twenty hours from Upington. Paauw¹ here. I noted a large amount of excellent agricultural land. We left at 3 P.M. and raced along a good hard road. Then into a sand-dune snow-white with shells!² Where have they come from? The German Palæontologist will tell you that the same species is to be found in North Africa in the bed of the mighty Nile. His English colleague, the Anthropologist, will follow the spoor of the Kalahari Bushman to the cave of Altamira in Northern Spain. Bushmen and shells, both early emigrants from Southern Europe—crossing the Mediterranean, the one at Cadiz and the other at Cairo—preaching the gospel of Closer Settlement in the primitive days of the Great Thirst Land. Towards

¹ Dutch for peacock—species of bustard.

² Dr Van Hoepen, Government Palæontologist, Pretoria, writes: "The small shells you brought me belong to the sub-genus *Corbicula* and the large shells to *Unio*."

The Conquest of the Desert

evening we traversed splendid farming land—a soil of river-silt—the overflow of the Molopo. Vast stretches of bushman grass. Outspanned at 6 P.M. at the end of Springbok Vlei. Shot some partridges. Fine night.

Saturday, 11th May.—Started at 6.15 A.M. Crossing sand-dunes. Arrived three hours after at Obobogorop which, being interpreted, means “the hole dug out by the ant-bear in which water was found.” We are only now $2\frac{1}{2}$ miles from the German border, and dim against a red sand-dune can see International Beacon No. 92. Here we had a chat with Mr H. C. Botha, who owns 7000 morgen, and has struck fresh water at 64 feet. Farmer Botha wants: (1) a Government bore; (2) a telegraph or telephone; (3) a post office. He points out that all the German Police Posts are supplied with telephones. In fact, the whole country (German South Africa) is now a network of telephone wires, linking with civilisation the loneliest settler and the most distant police station.

At Obobogorop the Cape Mounted Police have a sub-station. The corporal in charge was out in the desert alone on his camel, so we did not see him; but Privates Freeman



THE PUFF-ADDER. A DESERT DANGER.

Where Two Empires meet

and Nicholson entertained us in a kindly manner.

.
Here I took a photograph of a handsome spreading tree growing on a sand-dune. It is called the Kwa Boom, but seems to be the same as the Vaal Kameel Doorn found at Kuruman. It thrives best in the desert zone, bears legumes (pod-forming fruits), and is a lime-lover. Thus I was not surprised to find a layer of limestone in an old well dug out in the straate below. Shortly before we left Obobogorop it became intensely hot. At noon William noted the fresh spoor of a snake across our path. We at once followed and killed a healthy, horrid, puff-adder of over four feet in length. It is an unwritten law laid down by the desert dwellers that all deadly snakes must be instantly attacked and killed regardless of risk. At half-past three we outspanned in the Lan Vlei, where we picked up a curious fur-covered, burrowing spider, possibly a rare species. Just as we had begun our afternoon tea I observed my comrade cutting a piece of cake for me with the knife with which he had opened the jaws of the puff-adder. It was a shuddering thought—a friend's delicious cake flavoured with the

The Conquest of the Desert

poison-sac of a puff-adder ! I fear I am still a tenderfoot. I say nothing, but noiselessly hide my cake in a tuft of bushman grass. Outspan at Narougas (Onderste) in the trough of a huge sand-dune. A fine calm night.

Sunday, 12th May.—Started at 6.30 A.M. Stopped at Spannenberg's farm. It is sad to see the commingling of black and white blood in so many parts of this country. Passed Peppler's. Immense dry pan of good soil. Outspan at Saulstraat at 11 A.M. I am sand-sick, and tired. 2.15 P.M.—the last of the Kalahari sand-dunes. Render thanks to a kind Providence. Middle Post and her three Wardens of the Marches—stern, black kopjes. Now a fine hard road. Look ! There are the mountains on the German border ! And there a German settler's home ! See that glorious fertile plain. What a chance for dry-farming ! Start to plough it early in the morning, and come back on the return furrow late next day. Cross the Mooi River—dry, but verdant. Then we swing along the hard and gleaming veld to that ribbon of trees green on the nun-grey soil. Sunset and Rietfontein. Purple mountains, lights and shadows, and "Good-night" to the Great Thirst Land. I lie down in the Bastard



(FIG. 1.)

AN OUT-POST OF EMPIRE.

This is the lonely station of the Mounted Police at Obobogorop, two miles from the German Border. (Privates Freeman and Nicholson, Cape Mounted Police.)



(FIG. 2.)

DIAMOND DIGGERS AT RIETFontein, GORDONIA.

Should diamonds be discovered the sand dunes of the Desert will soon disappear before the genius and enterprise of the railroad engineer.

Where Two Empires meet

Bandit's (Dirk Vilander's) little cottage, and go fitfully to sleep dreaming of these awful dunes.

.
Next afternoon I drove to the spot, a mile and a half away, where the two great Empires meet, and saluted Beacon No. 72. On the sunlit west is the German Eagle, with the writing "Deutsches Schutzgebiet." On the purple east are the Royal Arms with the writing, "British Territory."

All round—desolation ! Why should not the two Empires cease building on the barren sea for just one year, and set aside the money saved for dry-land experiment stations—Desert Dreadnoughts—to reclaim those sun-washed wastes for their settlers and for humanity !

"Ah, these," you say, "are idle dreams." Perhaps ! But what is that speck down there in the village of Rietfontein ? It is a diamond digger feverishly at work. He, too, is dreaming. And—who knows ? A single gem—a wild rush, and the Pullman sleeper is drawn across the sand-dunes of the desert. It has happened before in South Africa. It may happen again. As for me, I shall continue to dream my dreams,

The Conquest of the Desert

and here in this mud-hut I like to repeat those glorious lines : “ The Last Lands are the Best Lands. It needs science and great numbers to cultivate the best lands and in the best manner ” (EMERSON).



WHERE TWO EMPIRES MEET.

(International Beacon Post No. 72 at Rietfontein.)

On the left Native Private William is saluting the German Eagle
On the right Tracker Jacob is saluting the Royal Arms.

**THE SHADOW OF THE GREAT
THIRST**

CHAPTER VI

THE SHADOW OF THE GREAT THIRST

MOST people are aware that the Kalahari is commonly called "The Great Thirst Land." But in the midst of the comforts and blessings of civilisation there must be few indeed who fully realise the true meaning of this term, or the perils of a country which, although close up to our border, and part of which comes under the jurisdiction of the Union, is less known than the forests of Aruwimi or the mountains of the moon. It is not, however, of the heart of the Kalahari that I wish now to speak, but merely of that southern portion which overflows into the district of Gordonia. This particular spot is the most arid portion of the whole desert, since northwards the rainfall slowly increases until you gain the green rushes of Lake Ngami. Travel anywhere you like throughout the vast territory of Gordonia, and you will always hear the same heart-rending tale. Every summer some death from thirst—every winter the sudden sinking of some poor woman crying for

The Conquest of the Desert

a doctor's skill. Isolation—Desolation. No roads, no railways, no telephones, no telegraphs. And these people are our fellow-citizens, and they fall within the Union of South Africa.

.

I shall now write of a recent tragedy in this Great Lone Land. No words of mine shall embellish this simple, moving story. A young Irish private in the Cape Mounted Police started out from Zwart Modder to his camp at Nakob. He lost his water-bottle—that is all. In the Kalahari, after this, there is nothing more to be said—just leaden silence. True, no man saw him die. But that makes no difference: for his reeling steps, etched on the burning sands, have been all recorded by the faithful desert trackers who followed hard on his spoor, dug his grave at midnight on the dunes, and fired the last salute. It is their wonderful record that we shall read. They did their duty, quickly, travelling day and night. Have we done ours?

The history of this tragedy is told by Sub-Inspector Geary, of the Cape Mounted Police, from his own observations, and from the testimony of the native trackers who were sent out to find the spoor. It is dated Zwart



JACOB, THE DESERT TRACKER, AT WORK ON THE SPOOR.

The Shadow of the Great Thirst

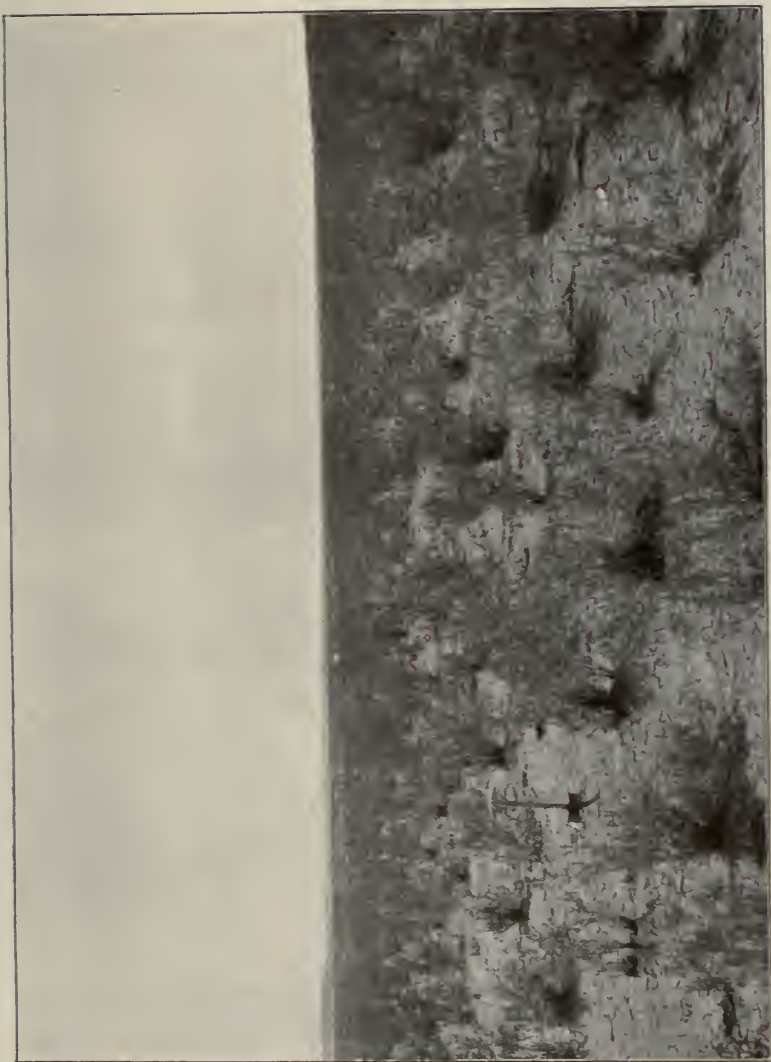
Modder, 8th January 1912, and runs as follows :—

“ On Thursday, the 28th of December, Private Blank arrived at Zwart Modder from Nakob to report, by a curious coincidence, the finding of the body of a native woman, who had died from thirst between Nakob and Zwart Modder. On the evening of Sunday the 31st, Private Blank left to return to his station, riding his troop horse and leading another which the store-keeper was sending to a friend at Nakob. He slept that night at a cattle post about four miles from Zwart Modder and this was the last place at which he was seen alive. At daybreak on Monday, the 1st of January, he left the cattle post and cut across the veld to the Nakob road, and from this point the story is carried on by the evidence of the spoor. As soon as Private Blank reached the road he dismounted, for some reason or other, and whilst dismounted the led horse took fright. He endeavoured to hold it by the stirrup leather, which came off in his hand. This horse then galloped away in the direction of his usual grazing-ground, dragging the reins, which later on became entangled in some bushes. Meanwhile, Private

The Conquest of the Desert

Blank's horse had taken fright and cleared off in the direction of Nakob, keeping to the road through the sand-dunes. The troop horse carried his water supply, and he evidently decided to follow it, and set out walking along the road ; the horse apparently being out of sight, for on reaching a spot known as Jakhal's Vlei the horse turned off to the right on an old road leading to Omdraai Vlei. When Private Blank reached the junction of the two roads he failed to notice that the horse had turned to the right, so he kept on the road to Sand Vlei and Nakob.

“The horse proceeded for about $1\frac{1}{2}$ miles, then turned out to graze, when the reins fell over his head and he also became entangled eventually, with the reins hitched over the branch of a tree, where the bridle and headstall were subsequently found by a patrol. Private Blank proceeded along the road to a spot about 22 miles from here, where he turned off the road to the right. Monday was a day of terrific heat, and his object appears to have been to obtain shade, as he rested under bushes at two places near this spot. The time was now about midday (as he had rested on the southerly side of the tree). In the afternoon he appears to have



DESOLATION—A DESERT PAN.

Thousands of acres of these waste lands could be reclaimed by scientific methods of tillage, and turned into waving corn fields.

The Shadow of the Great Thirst

made another start and walked through the veld, still on the right, until he struck the road about $1\frac{1}{4}$ miles farther on, crossed over the road to the left, and went in the direction of Lang Klip, and after travelling for some miles he apparently slept for the night. The following morning, Tuesday, another day of terrific heat, he still continued towards Lang Klip, sitting or lying down occasionally (on the west side of a bush). In the afternoon he was evidently feeling the heat and want of water, for he commenced to rest very frequently and wandered aimlessly in circles, crossing and recrossing his own spoor, which led in all directions. On Tuesday afternoon (again judging by the shade side he selected) he turned on his tracks and wandered all over the veld, but generally in the direction of the point from where he had turned off the road the previous afternoon. Up to this point he had been stepping out quite briskly when walking, but now his spoor showed signs that he was weakening, his steps were shorter, and his rests more frequent. Tuesday night found him still on Lang Klip, and there he slept.

“ The following morning, Wednesday, he took a somewhat straighter course for the point where he had left the road, though weakening rapidly,

The Conquest of the Desert

until on Wednesday afternoon he was back to within 600 yards of that particular point. He was now suffering intensely, rested frequently, rolled and vomited. Now again he wandered and circled, crossing and recrossing his own spoor and an old waggon track—hopelessly lost. Suddenly a change occurred. He stepped out more briskly and kept a fairly straight course towards some dunes about four miles ahead, the only landmark visible from the spot, and he made for these on a course running roughly parallel to the Zwart Modder road, and about $1\frac{1}{2}$ miles south of it. A very slight shower of rain fell over this vicinity that afternoon, and this might have refreshed and encouraged him, but the end was now near. He reached the first dune, rested part way up, lay down on the top, then went over to the foot where he turned to the right, then back over the dune found a tree, threw away the stirrup iron and leather he had been carrying from the Monday morning (on the east side of the tree), lay down quietly on the west or shady side, and here we found him yesterday at 4.20 P.M. (7th January 1912). He died at least peacefully, too utterly worn out to struggle even in death, for he was fully dressed in tunic and leggings, and his smasher hat was



A LOCUST-SWARM.

Note the myriads of these insects in the air and on the ground. In the Voethanger or hopping stage Locusts can now be easily exterminated by means of poisoned rings on the Veld. The Kalahari Desert is their favourite breeding place. (Photo by J. M. J. Müller.)

The Shadow of the Great Thirst

still in position on his head. We dug a grave by firelight, and at midnight we buried him, with a parting salute from his comrades. At 2.30 A.M. our task was completed, and we returned to Zwart Modder. I might add, in conclusion, that nothing that could be done was omitted, and nothing could have saved Private Blank except an accidental meeting with someone. The first patrol left here immediately after the arrival of the led horse on Wednesday morning, and only reached the spot where the deceased first left the road nearing sunset, and by that time Private Blank must have been dead. The two horses only broke loose when desperate from want of water."

So ended the Sub-Inspector's report.

.

It is sometimes said that we must go slowly, that we must not unduly hasten the progress of South Africa. Perhaps by the white dumps of the Rand this statement may carry a little weight, but by the side of a flaming sand-dune it is surely the grimmest satire. No one in South Africa will soon forget those long hot days that closed the old year and brought in the new. It was over 100 degrees in the shade. We grumbled and perspired, and sought

The Conquest of the Desert

some shady corner, and called for an iced drink, at the self-same hour that poor Blank, delirious for want of a drop of water, was staggering to his death on the summit of a blazing sand-dune.

Is the same tragedy to be repeated next summer? Down the ages comes the excuse of Cain, "Am I my brother's keeper?" only to be blotted out by the glowing words of the Apostle to the Romans, "For none of us liveth to himself, and no man dieth to himself." The remedy is as simple as it is urgent. Let us spend at once a few thousand pounds in linking up the water-holes, stores, and police stations along the pathways of Gordonia by means of field telephones. If this has been done over all the comparatively poor Province of German South-West Africa, it can surely be done also in the far richer country of British South Africa. For the telephone will lift the sombre shadow from the Great Thirst Land, and in the sunshine of a new era the first message to be transmitted from the twin capitals¹ to the lonely settlers along the Kuruman, the Molopo, and the Nosop must be taken from the Book of the Prophet of the Wilderness and the solitary place, "And the desert shall rejoice, and blossom as the rose."

¹ Cape Town and Pretoria.

THE VISION OF THE PROPHET

CHAPTER VII

THE VISION OF THE PROPHET

"I will make the wilderness a pool of water. . . . I will set in the desert the fir-tree and the pine."

IN the forty-first chapter of Isaiah we read the vision of the Prophet in those matchless lines which appear at the head of this chapter, and no one who has gazed on the crystal "Eye" of Kuruman, or has drunk deep from the translucent wells of Rietfontein, can for a moment doubt that we are about to witness the fulfilment of an ancient prophecy. In this final paper I propose to set down a few facts and figures gleaned during my recent journey, and thereafter shall leave the reader to form his own opinion of the agricultural potentialities and prospects of the Southern Kalahari and the district of Gordonia.

The agricultural history of Gordonia may be said to date from the building of the Upington Irrigation Furrow by a Dutch missionary, the Rev. Mr Schröder, with the aid of the Bastards. It was twenty-two miles long, and in lieu of

The Conquest of the Desert

money the Bastards received the land which could be placed under the furrow. Since that time the Bastards have gradually been displaced by European colonists. New furrows have been built, and every year more and more land is being watered by the Orange River. An erf at Upington consists of six morgen. An erf is valued at the present time at fifty pounds per morgen, which includes a building plot—viz. a dry erf above the furrow having an area of 100 by 100 feet. As I have pointed out, the valley of the Orange River is probably the grandest citrus region in the world, and both river banks will one day be studded with thousands of orange-trees. The two great needs of this industry at Upington are, firstly, the Government entomologist to instruct the growers how to deal with red scale, which has already made its appearance, and, secondly, the Government horticulturist to give a practical demonstration in picking and packing, the best stocks to use, and the most profitable varieties to plant for the oversea markets. The fatal error of the orange farmers about Upington and Kakamas is the excessive use of water. This induces the disease known as root-rot, the symptoms of which are readily recognised in

The Vision of the Prophet

the dying back of the tips of the tree, the yellowing of the leaves, and the darkening of the wood of the stem. If orange growers throughout South Africa would only study the principles of dry-farming they would have far healthier trees and far finer fruit.

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In former times Upington was famous for wheat grown under irrigation. Mr M. G. Holmes, the leading merchant, and a resident of twenty-two years, told us the story of a sample taken out of some bags which had been sent to his flour mill to be ground. This sample was sent to the Kimberley Exhibition, where it gained the first prize, and was judged to be the finest wheat ever seen in South Africa. It was then forwarded to the Chicago Exhibition, where it won the premier place in the contest open to the world. Since then the wheat of this region has greatly deteriorated. This is due to several causes, amongst which the following may be mentioned: continuous wheat-growing without rotation, or fallowing, shallow ploughing, lack of cultivation and selection. It should never be forgotten that the dry farmer has one great advantage over the irrigation farmer, which is seldom emphasised, and that

The Conquest of the Desert

is that the fields of the former are always much cleaner than the fields of the latter. Noxious weeds are often spread far and wide with the waters of the irrigation furrow.

Another crop which grows luxuriantly at Upington is lucerne, and several ostrich farmers have already taken up land along the Orange River for the development of this industry. Formerly a large trade in baled lucerne was done with the German border, but the line is now closed owing to live-stock regulations, and the local market is overstocked. The same is true of every branch. The agricultural industry is languishing for lack of a railway. Trade is paralysed. There is no market for corn or maize, for fruit or garden produce, for poultry, eggs or pigs. With suitable market facilities Upington should be the Paradise of the small holder.

.
At Zwart Modder we were hospitably entertained by Mr Harris, who combines the occupations of trader and farmer. He owns a fair-sized farm even for this part of the country—namely, 38,500 morgen; while his twenty years' connection with the Southern Kalahari enables him to speak with authority. It may



(FIG. 1.)

ZWART MODDER—SHOWING THE DRY BED OF THE MOLOPO.
This must once have been a mighty river.



(FIG. 2.)

A DESERT SCENE.

Note that oxen are now inspanned to the Cape Cart instead
of mules, owing to the heavy nature of the sand.

The Vision of the Prophet

be of interest, therefore, to give his answers to some questions I put to him.

“What are the chief needs of your district?” I asked.

“To my mind,” said he, “the first great need is drills, and I am glad to learn that Mr Ireland, the Government Boring Engineer, intends shortly to pay us a visit. Then a railroad from Prieska to Upington is an absolute necessity. This part of Gordonia is essentially a live-stock country. At present we have to drive our animals through heavy sand from Zwart Modder to the railhead at Prieska, a distance of, roughly, 200 miles, and by the time they reach the trucks they are weak with travelling and poor in condition. Furthermore, telegraphic communication is urgently needed between Rietfontein, Zwart Modder and Upington, if only for humanity’s sake, so that a doctor could be wired for in cases of serious illness. Touching the question of underground streams, I am of opinion that water will be found all over the district of Gordonia at depths varying from 30 to 100 feet.”

“Tell me about the Molopo.”

“Well, as you see, this store is standing in the dry bed of the river. Eighteen years ago the

The Conquest of the Desert

Molopo came down in a great flood, and, being blocked by sand-dunes, it left its old course, flowed westwards instead of southwards, formed a huge lake, and finally dried up altogether at Abiquas Puts, about six miles from the German border. Now, the extraordinary thing to us folk living here is that millions of fish swarmed in the water of Abiquas Pan—mostly barbels. And what we want to know is, where did these fish come from? Farmers from far and wide came and carted away barrels and barrels of fish, but they could make no impression, and when at last the pan dried up the stench of decaying fish was so terrible that the spot was impassable for a long time. Another interesting fact is that, at Vrouwen's Pan, in the bed of the river, we have found a vast quantity of shells. Not far from here are to be seen many Bushman graves, and the decaying stumps of huge camel-thorn trees—a clear proof of a fine forest that has since been ruthlessly destroyed. The Boers in this part of the Union are trek Boers. Now the first thing that a trek Boer does is to erect a tent, and he sends out his waggon and his boys to cut down the nearest native trees for poles and firewood. And as he never plants, the work of devastation goes on unchecked year

The Vision of the Prophet

after year. So, too, with the trader trekking across the Kalahari. But the destruction wrought by the trek Boer and the trader is nothing when compared with the constant migration of these vandals of the desert, the Bastards and the bushmen, who scour the country for timber for their fires, their huts and their weapons. Soon there is nothing to attract the moisture-bearing clouds, no humus to hold the rushing rain when it comes, only an iron-shedding surface or the parched and thirsty sand. Between Zwart Modder and Upington, a distance of sixty miles, there are not more than a dozen planted trees. The first move in the conquest of the desert must be afforestation."

"Do sand-dunes grow?"

"Yes; even in a month's time we often notice that a dune has grown a good deal higher—more especially if there has been little or no traffic. Just a mile down the river from the store you may have noticed that a scarlet dune has thrown an arm across the white alkaline bed of the Molopo, making a very pretty picture. The cure for the encroachment of sand-dunes is population, building, tree-planting, traffic—anything, in fact, pertaining to civilisation. As you will have observed, the sand-dunes run east

The Conquest of the Desert

and west. Besides the tsamma melon and the bushman grass, both of which thrive upon the sand-dunes, there is also a desert luxury. This is what the bushman calls "nabba," and the Dutch farmer the Kalahari potato, but which is nothing more or less than the European truffle. It is found in enormous quantities during winter-time, when the sand is firm and hard, a few inches beneath the surface of the ground. It can be detected by cracks in the sand, and is greatly relished by the desert-dwellers."

.

A note concerning the camels used by the mounted police and to carry the mails may be of interest. At the present time the police own twenty-five, some of which have been imported from Egypt, some from India, and some have been bred at Rietfontein. The chief value of the camel is, of course, that it can go for a week or more without water. It will also travel with ease in heavy sand, and can endure any amount of heat. The best Australian camel, "Lalla," used to do regularly a journey of 100 miles in eight hours. A first-class camel can carry a ton in weight, but the camels of the mounted police are only weighted to the extent of 500 or 600 lbs. The Post Office authorities possess



(FIG. 1.)

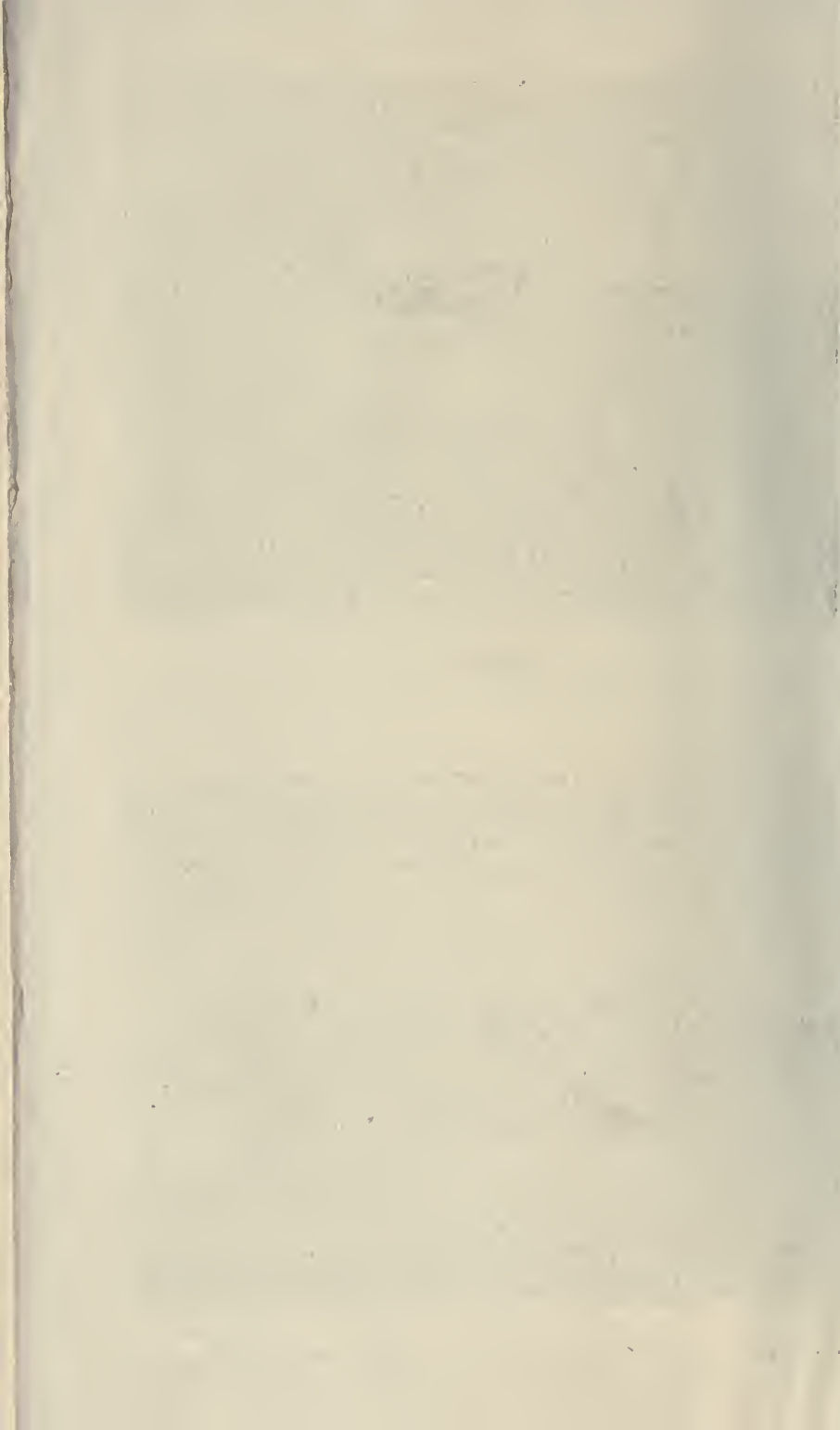
NIGHT ON A SAND DUNE.

The Author with his Jaeger Sleeping-Bag, Mosquito Net, and Folding Bed.



(FIG. 2.)

A BUILDING BOOM IN THE MAIN STREET OF RIETFONTEIN, GORDONIA.



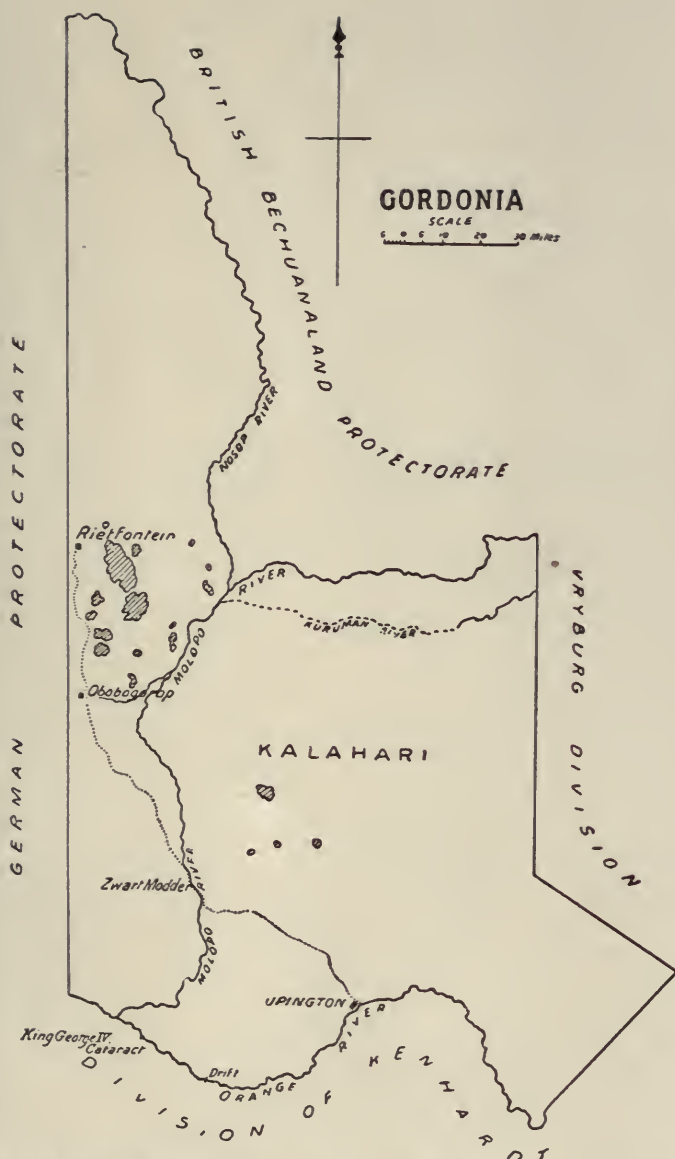
The Vision of the Prophet

six camels. They run from Rietfontein to Zwart Modder, leaving Zwart Modder on Wednesday morning and arriving at Rietfontein on Saturday morning—a distance of 140 miles. In the Kalahari Desert the favourite food of these camels is the kaa-boom (Vaal kameel doorn) and mimosa. They much prefer feeding on trees to grazing on grasses. The desert can be crossed in five days on a camel. A Government camel farm established at Rietfontein would do much to improve the breed of this valuable animal.

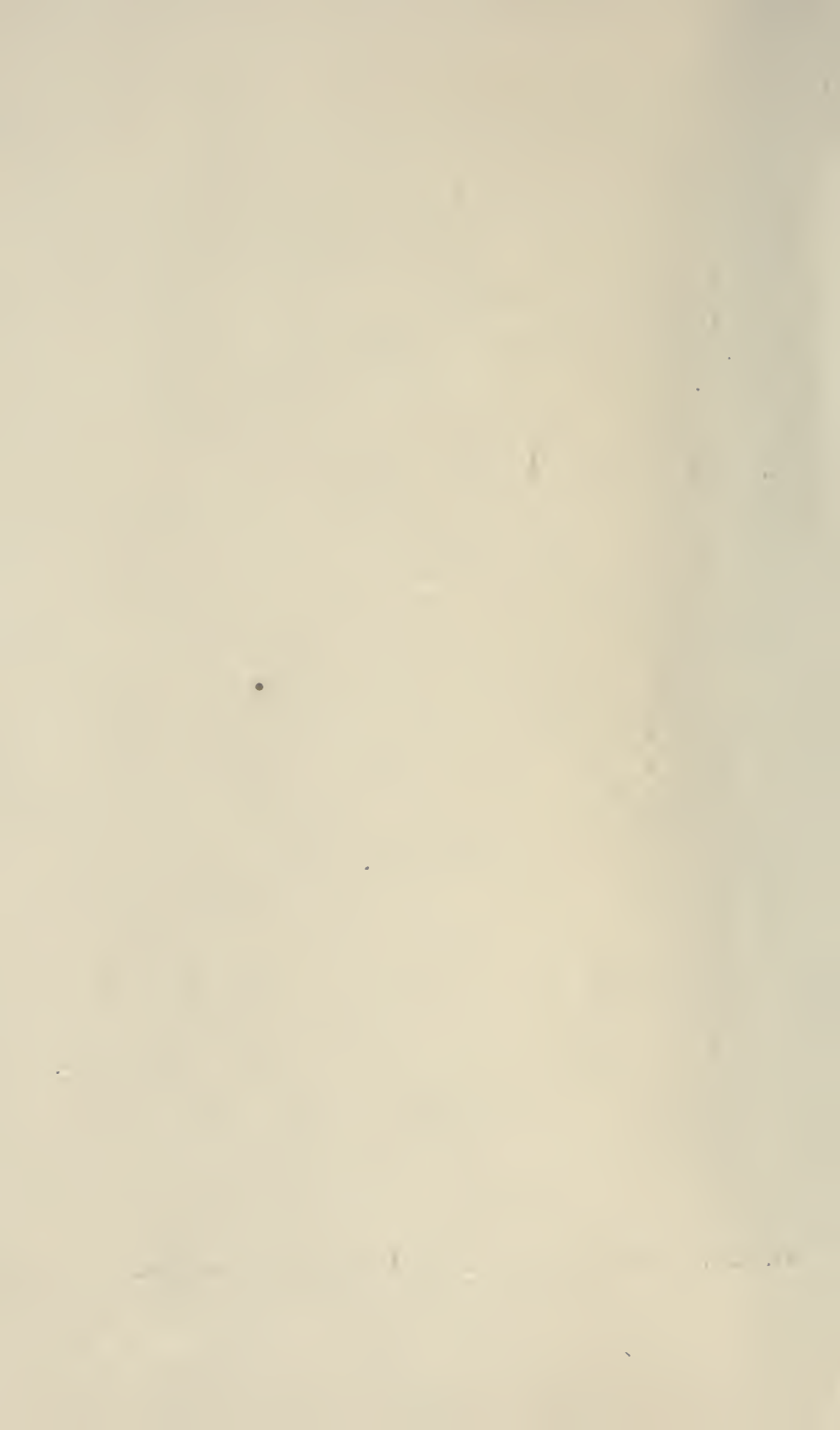
The future of Gordonia and the Southern Kalahari is assured. This region is destined to become famous both as regards ranching and general agriculture. It is a healthy country for cattle, horses and sheep. They all wax fat and multiply exceedingly. A casual survey reveals three types of excellent agricultural soils—river silt, sandy loam, and alkaline, or brak-land. With regard to the first, it is to be found in the dry bed of the Kuruman, the Molopo, and the Nosop. It is the best and richest of the three, and could be made to produce almost any crop. Next come those vast stretches of sandy loam which respond amazingly to proper tillage, and by means of moisture-saving fallows will

The Conquest of the Desert

hold sufficient water to mature a crop even in the driest seasons. Last of all is the brak-land, which can also be put under cultivation by the methods adopted by Professor Hilgard with such success in the arid regions of California. Science is never still ; but what we need most of all is men.



MAP OF GORDONIA SHOWING THE KURUMAN, MOLOPO, NOSOP, AND ORANGE RIVERS.



WHAT THE BROWN EARTH GAVE
TO THE BLUE

CHAPTER VIII

WHAT THE BROWN EARTH GAVE TO THE BLUE

IF you leave Johannesburg any day before noon you will arrive soon after eight the same evening at the little town of Christiana. It is worth while to rise early in the morning as the lights and shadows flit across the river, touch the Transvaal, leap into the Free State, and race madly onward to salute their fairest sister where the dawn breaks on Fourteen Streams. There at the gateway of the Golden West you will hear the call of the desert, and the men are moving Westward, ever Westward, from Mafeking to Morokwen, and from Kimberley to Kenhardt. They are the advance columns of the great army of colonists who will one day penetrate into this fertile region. No land for settlers in South Africa! Surely men are dreaming. Northward, westward, southward for 500 miles you may travel, day after day, on these sunlit plains, dry as dust, hard as nails with their priceless treasures—æons of fertility—only waiting to be won. But these lands are

The Conquest of the Desert

not for the indolent, the doubter, or the easily dissuaded, but for the mighty toilers—multitudes of men poured in along the railroads with constant reinforcements.

In Christiana are furrows of flowing water, patches of vivid green, a handful of houses, a fringe of tall blue gums; and beyond—the infinite mirage-streaming, nun-grey, desert. The district of Bloemhof is the driest in the Transvaal. But it was not always so. Search out the patient voortrekker, smoke the peace-pipe and listen to his tale. Thirty years ago this was a thickly wooded country, and the rain fell so heavily that two spans of oxen were often needed to haul the waggons across the drifts. Do you see that lone tree on the far horizon? It is the kameel-doorn (camel-thorn). There were thousands and thousands then, there are none now. It is slow-growing and deep-rooting, seems to pause and spurt in cycles of seven years, burns with intense heat, and makes a first-class lingering fuel. Wherever it grows there you will find good deep loamy soil. Over there on the farms of "Sweet Home," "Just-in-Time," and "Never Mind" were thick forests of camel-thorn. But they were all cut down for the Kimberley mines at £80 per waggon-load.



(FIG. 2.)

THE EYE OF KURUMAN.

The water gushes out underneath this huge mass of dolomite. The entrance to the wonderful cave is below the reeds shown in the picture. Standing in the foreground is Mr. Stewart, Civil Commissioner and Resident Magistrate.



(FIG. 1.)

THE DRY-FARMER'S GUIDE.

Showing the *Vaal-bosch*, which denotes a limestone soil. Note the shallow root system. Usually, plants growing on dry or desert lands are deep-rooted, but it is not always so.

What Brown Earth gave to the Blue

Such was the sad tale of destruction told us by the old pioneer. So the brown earth was robbed for the blue, and the forest of Bloemhof paid tribute to the priceless gems that glitter on fair fingers in the Avenida, the Bois, Fifth Avenue and Hyde Park. And like the prophet Jeremiah, in place of a plentiful country, full of fruit and goodness, we find a wilderness and a land of drought.

.

It is an astonishing fact that the art of afforestation seems to have synchronised with the rise and fall of Van der Stel. He encouraged the early settlers to plant trees. But that was over two hundred years ago. To-day you may travel in South Africa by rail or waggon over measureless spaces of treeless plain. And there is a sadness rather than a spice of humour in the story of the townsman who was visiting his country cousin somewhere in the western Transvaal. The sun-splashed, unhindered veld swept to the distant horizon. A solitary blue gum stood out like a lonely sentinel beside the setting sun. "I planted it," the farmer said. "How long have you lived here?" the shopman asked. "Thirty years," came the proud reply!

The beneficial influence of the forest on the

The Conquest of the Desert

farm is too well known to need any special emphasis. All over the country those land-destroying dongas—due to torrential rains sweeping over the naked veld—could be largely checked by afforestation. In the United States it is estimated that about 200 square miles of fertile soil are annually washed away in the brooks and rivers. As we stood spellbound before the rushing Orange River at Kakamas our guide remarked with a smile of satisfaction : “Yes, the Transvaal may have her gold, but we have here her richest soil—thirty feet of solid silt.” Then, again, the forest waters the farm. Local showers are much more frequent in the neighbourhood of woods than in the open country. And since the leaves and branches break the force of the falling drops the rain falls softly on the soft forest floor and percolates deep into the soil. There is likewise much less evaporation around a forest belt, because the air is cool and still. Springs also are fuller than in treeless regions. Moreover, the forest tempers the farm. Hear the testimony of an Illinois farmer : “My experience is that in cold and stormy winters fields protected by timber belts yield full crops, while fields not protected yield only one-third of a crop. Twenty-five or

What Brown Earth gave to the Blue
thirty years ago we never had any wheat killed
by winter frosts, and every year we had a full
crop of peaches, which is now very rare. At
that time we had plenty of timber around our
fields and orchards ; now cleared away."

That live stock thrive much better when they
are protected from the cold blasts of winter and
the trying heat of summer is common knowledge.
Thus shelter belts are of equal value against
the biting winter winds of the high veld and
the summer heat of the low veld. Lastly, the
forest can be turned into a farmer's savings
bank from which deposits may be drawn from
time to time. Two farmers, Messrs Matthew
and Dreyer, from a single erf in Burgersdorp,
just outside the town of Lichtenburg, cut last
winter seventy pounds worth of timber. These
eucalyptus-trees were planted six years ago, on
dry land, and uncared for. Every farm should
have its own forest. It may be only one acre
or ten thousand. The rural economists of
Europe recommend that 20 per cent. of the
farm should be laid down to forest—that is
to say, on a farm of 1000 acres 200 acres should
be planted with trees. What a wonderful
difference this would make to the climate and
crops of South Africa ! The farmer who plants

The Conquest of the Desert

trees will soon find out that not only does he save money, but he can also sell his timber at a profitable figure. For example, some trees make excellent fence posts, scaffolding and flooring, while others are suitable for furniture, mining props, butter and cigar boxes.

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The value of shelter belts is undoubted, but farmers often find it difficult to get crops to grow close to the base of trees. In a comprehensive bulletin on "Windbreaks" issued by the United States Department of Agriculture, Mr Bates, Forest Assistant, gives the results of several years of investigation. He points out that crops which are grown principally for their vegetative parts rather than for their seeds can stand the shade better. In other words, whilst a crop of corn (maize) which is grown for its grain might fail entirely on a strip of sunless ground near to the trees; yet the same land might be profitably planted with fodder, corn, clover, or lucerne. As is well known, fruit trees on the edge of an orchard are usually small in size. Thus in California it is customary to dig trenches to cut off the roots of eucalypti and other tall trees, planted around orchards, in order to prevent the forest trees taking



(FIG. 1.)

A WIND BREAK.

Every settler on the Dry Lands of South Africa should start at once to lay out a small plantation in order to break the force of the moisture-wasting wind, to afford shade for his live-stock, as well as for the beauty of his home. Captain Heinrich S. du Toit, Superintendent of the Dry-Land Station at Lichtenburg, is shown in this picture.



(FIG. 2.)

DRY-LAND PRODUCTS.

Before Dry-Farming these lands were a barren waste. They now yield abundant crops of Potatoes and Maize.

What Brown Earth gave to the Blue

moisture from the fruit trees. It may be well now to give the names of a few varieties which may be planted, without hesitation, in the more arid parts of the Union. We shall select seven which have been tested at the Government plantation at Lichtenburg. Of these seven the first two to be mentioned are specially suited for shelter belts ; whilst the remaining five are valuable for timber.

For shelter belts—

(1) *Eucalyptus viminalis* (manna gum). Excellent for fuel. Can be used for rough farm work, rafters, scaffolding poles, etc.

(2) *Eucalyptus stuartiana* (Stuart's gum or apple-scented gum).

For Timber (quick-growing)—

(3) *Eucalyptus rostrata* (red gum). Heavy, hard, durable timber.

(4) *Eucalyptus sideroxylon* (iron bark). Valuable for railroad sleepers.

For Timber (slow-growing)—

(5) *Juniperus virginiana* (North American pencil cedar). Cedar of commerce. Makes durable fence poles.

(6) *Callitris robusta* (Murray cypress pine). For furniture and flooring. Resistant to white ants.

The Conquest of the Desert

(7) *Cupressus arizonica*. Excellent for timber. Seems to be quite frost-resistant.

It should be said that the five above-mentioned trees may also be utilised for shelter belts and windbreaks. If any of our readers desire further information on these and kindred matters we would refer them to Mr J. Storr Lister, I.S.O., Chief Conservator of Forests, Pretoria. We are of opinion that our farmers do not take the fullest advantage of this valuable branch of the Government service. It is worth remembering, however, that this Department controls some 1,200,000 acres of natural forest and has set out some 50,000 acres of plantations, and possesses a staff of 250 foresters with over 5000 labourers. Plantations and nurseries have been established at forty-six centres. In any scheme of land settlement which may ultimately be adopted in South Africa, it is to be hoped that the planting of trees will be made a special feature on every Government homestead ; and, further, that the little people in every town and every country school shall be encouraged to set out their tiny garden forests and to watch them growing day by day. And although the great work of afforestation—nation-building in the noblest

What Brown Earth gave to the Blue

sense—must go steadily forward in all parts of the Union, yet none but the struggling settler on the wind-driven desert can fully realise the cheering welcome of a grove of blue gums, never-failing guides, in storm and sunshine, to his helpmate and his home.

THE POOR AND THE LAND



CHAPTER IX

THE POOR AND THE LAND

IN this chapter I shall tell the story of the origin of the Kakamas labour colony, situated on both sides of the Orange River, in the twin districts of Kenhardt and Gordonia, and distant 180 miles from the railhead at Prieska. Some twelve years ago a certain clergyman of the Dutch Reformed Church, the Rev. B. P. J. Marchand, of Wellington, became filled with the desire to do something towards the regeneration of that class now widely known as the "poor whites." Accordingly, he visited several labour colonies in Germany, and on his return recommended that something similar should be done without delay in South Africa. The Senate of the Church directed Mr Schröder, then missionary at Upington, to look out for a suitable site for the proposed settlement. He reported that at Kakamas there was a large tract of land which could be laid under water. This site was selected. Some farms were obtained free from the Government, others

The Conquest of the Desert

were purchased, and in the year 1897 the first settlers arrived.

But it is best to learn the history of this wonderful colony from the lips of those who are engaged in the great work. In his hospitable home the able and scholarly superintendent of the settlement, Rev. J. G. de Bruyn, was kind enough to answer my many questions.

“How many families are here now?”

“Four hundred. You will be surprised to learn that there are over 3000 souls in this settlement. We have 5000 acres under the furrow. The area of the whole settlement comprises roughly 150,000 morgen. We have one church and eight schools, with 700 children. Our settlers come from all over South Africa. Before being admitted to Kakamas they require to possess a certificate of good character and of poverty. Many more applications are received than we can deal with. When a settler arrives we set him to work on the canal, for which work he is paid four shillings per day. All furrows must be cleaned out at least twice a year, and every man is compelled to do his share of this work.”

“What is the size of each holding?”

“Every settler at Kakamas can obtain an erf. An erf consists of six morgen, which can



(FIG. 1.)

A MISSION HOME.

The Superintendent of the Kakamas Labour Settlement, Rev. J. G. de Bruyn, and family.



(FIG. 2.)

A SETTLER'S HOME IN THE KAKAMAS LABOUR COLONY.
Overcrowding.

The Poor and the Land

be laid under water. We consider that six morgen is sufficient to support a man and his family. Of course, a colonist may have to wait for two years, or even longer, before he can obtain a piece of ground, for the simple reason that water must be led to each erf and the trees cut down. The cost of clearing and levelling an erf of six morgen is £300, and it takes us about one month. We are spending £100 per week in labour alone in preparing the ground for farm crops, or, in other words, £5200 per annum."

"Do you give freehold to the settler?"

"No; that is vested in the colony. It might happen that a settler did not work his land, and we must have the power to take it away and to give it to someone more deserving. Moreover, a settler must pay a rental of £10 per annum for his six morgen. But we do not ask any payment the first year; the second he pays £2, and so on each year until he reaches the maximum sum—namely, £10. As the majority of the people who come to us are quite destitute, we advance them a small sum to buy a tent and a few of the necessaries of life. But the very first day the head of the family can get work on the furrow. It may interest you to know that close

The Conquest of the Desert

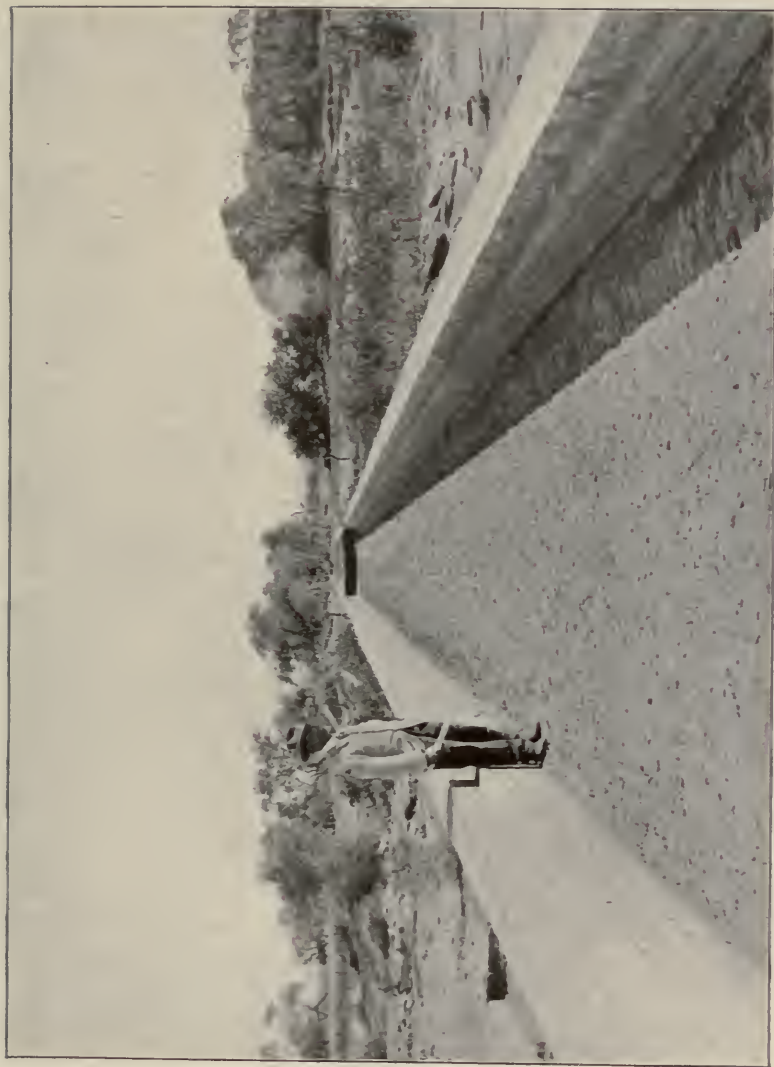
on 300 men are kept constantly employed in repairing and extending the various canals.”

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The Kakamas labour colony is a credit to the Dutch Reformed Church, and stands a splendid monument to the greatest thing that life holds out for any man, or sect, or nation—the uplifting of humanity. But, to my mind, the greatest thing you will find at Kakamas is the genius that first led out the furrow,¹ tunnelled through those granite walls, laid siphons under the river-bed, and can, with a child's touch, hurl a roaring cataract into the Orange, or send it softly speeding to the fertile lands twenty miles below. From the far-off leaping Malet-sunyane comes a thousand miles of the rushing river, and here you have it met with, played with, conquered and controlled.

Mr Johann Jacob Lutz, the builder of the Kakamas irrigation canals, is the son of a Swiss missionary who was sent out to South Africa by the Rhenish Society. He was born at Williston, Cape Colony, and after a varied career trekked northwards to Upington. Here he remained for several years helping Mr Schröder, the missionary of whom I have spoken,

¹ Irrigation canal.



THE KAKAMAS IRRIGATION CANAL AND THE BUILDER, MR. J. J. LUTZ.

The Poor and the Land

to dig the Upington furrow. In 1897 he crossed over to Kakamas, where he has resided ever since. To fully understand the material progress of the colony, you must consult Mr Lutz.

It was as we walked many a mile over the lucerne lands, across the islands, and along the furrows that I put these questions to him :

“How do you take the water out of the Orange River ? ”

“By means of two irrigation canals, which we call the north and south furrows. The north furrow is 24 miles long, and the south furrow is 17 miles long, varying in width from 7 feet to 10 feet and carrying 2 feet of water. The north furrow took nine years to build. Where our canals have to traverse hollow places and ravines we employ what is termed “dry packing”—that is to say, the outside wall is packed with stone, while the inside wall is filled with gravel. Now turn on the water, and you will find that the small holes in the gravel soon become filled up with silt. This makes the furrow quite watertight. If, however, we were to build it entirely of river silt, crabs and mice would soon make holes in the sides, and the water stream away.”

“Please explain the working of your siphons.”

The Conquest of the Desert

“ We use siphons to convey water from one height to another, across low ground, or from one island to another. These siphons are made of galvanised steel, sent out in sections from England. Each section is 4 feet long, and has a diameter of from 24 inches to 37 inches. They are then riveted on the spot. Our longest siphon is over 500 yards, and carries water from the north furrow.”

“ Do you intend to generate power ? ”

“ Oh yes ; we are already busy with several schemes. I forgot to mention that we have built two small waterfalls—one in the north canal, with a drop of 22 feet, and the other in the south canal, with a drop of 18 feet. With these falls we shall be able to generate electric power. We propose to light the settlement, drive a flour mill, and run workshops and factories in connection with our industrial school. The machinery has been purchased from the Swiss firm of Strelieu, of Zurich, and will be erected by a competent engineer.”

“ Tell me about your crops.”

“ Well, as you see, we have magnificent soil. It is pure river silt, in some places 40 feet deep. I daresay you will consider it the richest soil in South Africa. We grow mealies, wheat,



THE KALAHARI BEAN.

This nitrogen-gathering plant is an excellent soil renovator. It can be used as a green manure to restore fertility in the form of humus to worn-out Moisture-Saving fallows.

The Poor and the Land

oranges, lucerne, tobacco, potatoes, apricots and plums, apples, quinces and pears. We have reaped as much as forty bags of wheat to the morgen under water. We find that mealies, wheat and lucerne make a good rotation. Then we have an excellent soil renovator in the Kafir bean of the Kalahari Desert, a variety of cow-pea, which saves us buying expensive nitrogenous manure. We are just starting an ostrich industry. We believe that we possess a finer ostrich country than Oudtshoorn. Our erf-holders already own 150 ostriches and 36 young chicks, and so far we have had no losses. The birds seem to thrive in the warm, dry climate of this back country."

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The imperative need of Kakamas is a railway. For want of a market all real progress is paralysed, the future outlook gloomy. An erf of six morgen under water is certainly ample for an industrious settler, but not for his numerous family of young men and maidens. And what is their outlook? Cut off from the rest of civilisation, their character is warped and their development arrested, their ambition stunted. You can never hope to make one-half of these men farmers, but you may make them

The Conquest of the Desert

all skilled workers. Take wheat. Before it reaches the railway at Prieska twelve shillings must be paid on every single bag! But far more than that—a railroad via Prieska, Upington and Kakamas would transform the unknown Orange Valley into the grandest citrus centre in the world. This is no exuberant statement. No one who has seen Riverside can for a moment doubt that the deep silt of the “Great River” is far more nourishing than the desert soil of California.

Let us take a practical problem. The land now under water owned by the Kakamas labour colony is roughly 2500 morgen, or over 5000 acres. Take half that amount—2500 acres—and figure out the potentialities of this block of ground for orange-growing. If you plant wide apart, 25 feet by 25 feet, you can set out 70 trees to the acre. And at the end of five years you may safely reckon on an average of £1 per tree, or £70 per acre. This is all clear profit. Therefore we find that 2500 acres, multiplied by £70, gives the truly enormous sum of £175,000 per annum. But, apart from the mere culture of the orange, there must arise a real industry of packing sheds and factories for the manufacture of boxes. Packing oranges

The Poor and the Land

would afford a pleasant and profitable occupation for the daughters of the settlers, and work in the factory would inspire the inventive genius of their brothers. The Californian girls are paid 10s. a day for wrapping and packing oranges, and while at Riverside I saw a small machine, invented by a young mechanic, which tossed out 3000 boxes in a single day.

.

But is that all! Travel down the majestic river from Prieska to Kakamas. What a panorama of agricultural possibilities! Settle a handful of hard-working colonists—a paltry thousand from South Africa and oversea—give to each of them one hundred acres of river silt, wet or dry. Figure out this sum: 1000 by 100, or 100,000 acres by £70, or £7,000,000 worth of oranges per annum. Take two well-grown Washington navels. Together they weigh one pound. Reckon 800 on a tree, 56,000 on an acre, and you have 14 tons of fruit from every acre. Now remember that the special export rate for oranges is 15s. per ton, and you will find that from an orchard of 100,000 acres under oranges the railway receipts for freight alone in a single year would amount to a sum far over £1,000,000. Such are a few of the

The Conquest of the Desert

thoughts that arise in our mind, touching the larger problem of closer settlement along the banks of the Orange River.

We have spoken of the noble work of the founders of the Kakamas Labour Colony. But the Church must not forget that the searchlights of modern science and the new agriculture are now upon her. She holds in trust from the nation the richest land in South Africa. It is badly tilled, unused, rank, and foul with noxious weeds. She owns a bare and treeless square where her children pass and play in the scorching heat of noonday. What the Kakamas Colony needs is instant expert advice.

At the time of our visit there was no competent farm manager, no one to teach the settlers how to grow tobacco, how to lay down lucerne, how to prune their orchards, fumigate their orange-trees, or call a halt to the criminal waste of water and the consequent ruination of the land. To-day in many parts of South Africa men are toiling to win a bare livelihood on a foot of shallow soil, and when we think of the deep, rich lands of Kakamas we remember the parable of the hidden talent set down in the 25th chapter of the Gospel of St Matthew.

A RAINLESS WHEAT

CHAPTER X

A RAINLESS WHEAT ¹

“ Men, my brothers, men the workers,
Ever reaping something new,
That which they have done but earnest,
Of the things that they shall do.”

IN our study of the development of a rainless wheat, it will be necessary at the outset to sketch the rise and progress of that new branch of agricultural science now widely known as Dry-Farming. Dry-farming may be defined as the conservation of soil-moisture during long periods of dry weather by means of tillage, together with the growth of drought-resistant plants. It differs from ordinary farming in that the chief object of the dry farmer is to prepare his lands to receive and retain as much rain as possible. This is accomplished by the use of moisture-saving fallows.

“ Dry-farming ” is a new term which was first used a few years ago in Western America. In Utah and some other parts of the United States

¹ Reprinted by kind permission from *The Nineteenth Century and After*, No. 436, June 1913.

The Conquest of the Desert

it is called "arid-farming." Still another term is "scientific soil culture." For the sake of uniformity, all experiment stations, agricultural societies, and the rural press would do well to speak of dry-farming and dry-land agriculture.

It is sometimes said that dry-farming is a new agricultural practice. But it is not so. Even in America the farmers of Utah have been raising crops on their dry lands with a rainfall of less than fifteen inches for over half-a-century. More than that, dry-farming has been practised since the dawn of civilisation in Mesopotamia in Egypt, and in North-Western India. And, as Professor Hilgard, of California, remarked to the writer,¹ "the great depth of soil in arid regions as compared with that of humid climates undoubtedly explains how the ancient agriculturists could remain in the same country for thousands of years without having any knowledge of scientific agriculture." Most farmers are aware of the fact that the roots of plants go far deeper in dry regions than in damp climates. Now, if the roots of plants can penetrate to great depths, so surely must both moisture and air. It would thus seem as if an all-wise Providence

¹ See "Dry-Farming: Its Principles and Practice," p. 10. By William Macdonald. London: T. Werner Laurie.

A Rainless Wheat

had amply compensated the agriculturist of the arid regions by giving him in many parts of the globe great depth of soil combined with an almost inexhaustible fertility. Such, at least, is the lesson of history.

Summing up, we may say that desert regions are specially adapted to dry-farming, because as a general rule desert lands are deep lands, in which the scanty rainfall can be stored for a long period ; and, though arid soils are usually poor in humus, they are much richer in nitrogen than the soils of humid regions. It has been shown that the nitrogen-fixing germs are actively present in large numbers in dry soils. Finally, desert lands are usually free from malaria, and are thus well suited to colonisation.

THE PRINCIPLES OF DRY-FARMING

As the writer has elsewhere pointed out,¹ the English agriculturist Jethro Tull is entitled to be called the "Founder of the Principles of Dry-Farming." It is true that Tull saw as through "a glass darkly." To-day we see more clearly. But the principles which we have adopted are merely the amplification, nothing

¹ Bulletin No. 103, Union Department of Agriculture.

The Conquest of the Desert

more, of those fundamental methods of tillage so plainly set forth, one hundred and eighty-two years ago, by the genius of Jethro Tull.

In his agricultural classic (1731) entitled "The New Horse-Hoeing Husbandry, or An Essay on the Principles of Tillage and Vegetation," the inventor of the corn drill wrote : " For the finer land is made by tillage the richer will it become and the more plants will it maintain." This axiom has received ample confirmation on the arid lands of the United States and the British Empire, where the deep ploughing of the virgin prairie and the thorough pulverisation of the stubborn veld sets free æons of fertility.

It was Tull who first enunciated the three great principles of the new farming : (1) drilling ; (2) reduction of seed ; (3) absence of weed. And he left a happy epigram which at least is true for the sunlit lands oversea : " Tillage is Manure."

The principles which we have adopted in our experiments on the Government Dry Land Station at Lichtenburg, in the Transvaal, and which are now being extended to the other dry land stations throughout the Union of South Africa, are eight in number—namely, (1) deep ploughing ; (2) pure seed ; (3) thin

A Rainless Wheat

seeding ; (4) drilling ; (5) frequent harrowing ; (6) weedless lands ; (7) few varieties ; (8) moisture-saving fallows.

MOISTURE FALLOWS AND THE SOIL-MULCH

We believe that our success has been due mainly to the use of moisture-saving fallows, in which the rain is stored up in the soil for the use of subsequent crops. The supreme need of South African agriculture is not fertility but moisture. Consequently, all our cultivation is directed to establishing a moisture-saving fallow which may be maintained for periods of three months, six months, or one year. Such a fallow is deeply ploughed in the first place, and then kept constantly tilled to prevent the formation of a soil-crust which would permit the moisture to evaporate. This treatment results in four things : (a) storage of rainfall ; (b) destruction of weeds which are moisture-robbers ; (c) admission of sunshine and air ; (d) encouragement of beneficial soil-germs.

Messrs Russell and Hutchinson, of Rothamsted, recently demonstrated that intense sunlight destroys those harmful soil organisms which prey on the plant-food making bacteria.

The Conquest of the Desert

The illuminating researches of these scientists enable us more readily to understand the spontaneous and marvellous fertility of the lands of South Africa which are bathed in sunshine.

The germ life of arid lands is a subject worthy of the attention of the universities of the Empire.

The well-known term soil-mulch is deserving of a brief notice. It may be defined as "any material which is spread upon the soil to shade the surface from the sun and to break the connection between the water-bearing subsoil and the exposed surface." Examples of mulching are familiar to everyone. Turn over a board or stone lying on the ground, and you will find that the soil beneath is moister than the ground around it, since the pores of the earth, or capillary channels, have been closed, and the current of moisture passing upward to the surface has been stopped. In the garden, leaves, straw, and manure are commonly used. But the most practical mulch is made of loose, dry soil. This is done by frequently stirring the surface of the ploughed lands with a harrow or cultivator. The soil-mulch is also termed the soil-blanket.

Now the question arises : "How deep should the soil-blanket be ?" The reply is : From two

A Rainless Wheat

to six inches, depending on the state of the weather, the soil, and the crop. In orchard cultivation, during a severe drought, the soil-blanket is often made six inches deep, or even more. But for cereals the soil-blanket should seldom be thicker than two to three inches, as they are surface-feeders. When sowing, the seed must be drilled into the moist seed-bed below the dry-blanket ; otherwise it may fail to germinate.

SUMMARY OF RESULTS

It is doubtful if, since the time of Tull, any soil has had a severer test of his profound but forgotten principles than the dry lands of Lichtenburg in the Western Transvaal. Let us summarise what has been accomplished there. We have shown :

(1) That by our system of tillage we are able to keep the soil seed-bed moist for a whole year. This means that, so far as moisture is concerned, we can plant a crop at any season—a most important matter in South Africa. This result has been attained by the use of moisture-saving fallows, deeply ploughed, constantly harrowed,

The Conquest of the Desert

and kept covered with a dry-soil blanket which checks evaporation.

(2) That it is possible to grow dry-land winter wheat and to harvest it before the season of rust.

(3) That drilling, as might be expected, is far better than broad-casting, saves seed, places the grain in the moist seed-bed, and gives a more even growth.

(4) That thin seeding, for wheat 30 to 45 pounds per acre, gives larger returns than more lavish sowing. This is due to the fact that each individual plant has more moisture, sunlight, and food if given ample space.

(5) That the durum wheats have given the best results. They are the wheats which have extended the wheat-belt into the most arid regions of Western America.

(6) That the durum wheat—*Apulia*—has been grown under our dry-farming system without a drop of rain falling upon it from seed-time until harvest, which proves the efficacy of the moisture-saving fallow, and is a record in modern agriculture.

A GERMAN TESTIMONY

A short time ago a fair-haired, blue-eyed Viking was sent from Berlin to Windhuk to

A Rainless Wheat

grow two blades of grass where but one grew before, in the person of Mr Walter Richter, the Agricultural Adviser to German South-West Africa. He spent several months in British South Africa investigating our soils and crops with the skill, the patience, and the industry for which his race is so justly renowned. To our question, "What do you consider the most instructive part of your tour?" Mr Richter replied without hesitation: "The Dry Land Experiment Station at Lichtenburg. There I saw durum wheat being harvested which not only had been grown on a poor shallow soil, but actually never had a drop of rain upon it from seed-time until harvest. There, also, I saw *dry land* which is never dry the whole year round. I go back to German South-West Africa filled with a new hope, for now I am convinced that dry-farming is destined to revolutionise our agricultural industry. Truly, as the motto of your Congress puts it: 'The destiny of South Africa is on the dry lands.'"

Every great movement is indissolubly linked up with the personality of a few earnest workers. So it is with dry-farming in South Africa. The signal success which we have achieved is due in large measure to Captain Heinrich du Toit, a

The Conquest of the Desert

brave Boer officer of the former Staats Artillerie who bore a charmed life, as shown by the marks of twenty-two bullets. Captain du Toit returned to the peaceful life of a Cape farmer. When the Government dry land station was established he was appointed manager—a post which he still holds. He has since become the tireless missionary of the new agriculture amongst the Dutch and the English settlers on the dry lands of the Union.

DISCOVERY OF THE DURUM WHEATS

The most important discovery in connection with dry-farming is the value of durum wheat for poor soils and in regions of light rainfall. The durum wheats were formerly termed macaroni wheats, because in the past they have been mainly used in the manufacture of macaroni. But the better term is durum, and it should be employed to describe this class of wheat. The term durum comes from the Latin word *durus* (hard). For more than forty years there have been shipments into the United States of these hard, glassy wheats, chiefly from Russia, but also from Algeria and Chili. It is only during the last thirteen years, however, that

A Rainless Wheat

public attention in America has been directed to them, and this has been due mainly to the publications and efforts of the National Department at Washington. In the year 1900 Mr M. A. Carleton, United States Cerealist, was sent on a mission to Russia. He travelled through the durum wheat-belt and secured a large number of varieties ; these were distributed to the farmers and experimental stations in the Great Plains region of Western America, in which the climate and soils are very like those found in Russia and Algeria, where these particular wheats are largely grown. Mr Carleton wrote on p. 16 of his bulletin on " Macaroni (Durum) Wheats " :

"The normal yearly rainfall of the Great Plains at the one-hundredth meridian—where wheat-growing is at present practically non-existent on account of lack of drought-resistance varieties—is nearly three inches greater than that for the entire semi-arid Volga region, which is one of the principal wheat regions of Russia, and which produces the finest macaroni wheat in the world."

At first these wheats were received with but little favour, in spite of the fact that they gave

The Conquest of the Desert

excellent yields and showed remarkable rust-resistant and drought-enduring qualities. But the macaroni factories of America were then using the ordinary bread wheats, and neither the mills nor the elevators would accept the durum varieties. Happily, this prejudice has died down, and special mills are now being erected with the requisite machinery for grinding this type of wheat.

In blending with the softer varieties, and as a source of semolina, or "macaroni flour," durum wheats are now acknowledged to be unrivalled. But for the dry farmer the drought-resisting quality of the durum wheat is the most important point; and on the arid prairies of Western America they have surpassed all the best-known spring varieties, and are easily pre-eminent in this respect. Their rust-resistance is also noteworthy. This was first shown in a striking manner in America during the season of 1909, when the ravages of rust did so much damage to the common varieties.

The durum wheats are the best wheats to be grown where the summers are hot and dry; but they do not give satisfactory yields in humid regions. They first became prominent in the commercial world of the United States

A Rainless Wheat

in the year 1903, when six million bushels were produced. The annual harvest has steadily risen, until to-day the total crop is over fifty million bushels.

THEIR VALUE IN BREAD-MAKING

It was formerly supposed that the durum wheats were adapted solely to the making of macaroni and were not bread wheats at all. This is not so. Indeed, the excellent quality of Russian bread, which has often been praised by tourists and others, is largely made from Kubanka, a well-known variety grown in the Volga region. Furthermore, the French, who are justly renowned for their bread, invariably use a mixture of durum wheat. In Eastern Russia it is customary, for milling purposes, to mix three parts of macaroni wheat with one part of the ordinary red varieties. This proportion gives an excellent flour. It is said that bread made from durum wheat is richer, and remains fresh longer than that made from ordinary wheats. A large quantity of Russian durum wheat finds a ready sale for the macaroni factories of Southern France and Italy. A few years ago the United States Department of

The Conquest of the Desert

Agriculture made an interesting experiment to test the relative value of durum wheat for bread-making. A certain amount of flour from durum wheat and common wheat was set aside, and two sets of loaves were baked from the different flours. These two lots of loaves were marked, and sent out to over two hundred persons for inspection and report, accompanied by a circular letter containing eight questions. The people to whom the loaves were addressed were carefully selected, and included prominent millers, bakers, chemists, and teachers of domestic science. The result of their replies was summed up as follows :—"The general opinion, therefore, of the relative value of the durum-wheat loaf as against that made from other flour is 108 to 74 in favour of the durum-wheat loaf."

Before me lies a note on the Russian durum wheats, by Mr A. Kovenko, taken from a recent report of the Ministry of Agriculture, and kindly translated and forwarded by the British Ambassador at St Petersburg.

Mr Kovenko writes :

"Numerous as are in Russia the varieties of soft wheats, the chief place among our wheats belongs to hard wheats—*Triticum durum*—the

A Rainless Wheat

real pride of Russia, a grain containing a considerable amount of nitrogen, 4 to 5 per cent. While Western European varieties of soft wheat contain 6 to 7 per cent. of dry gluten,¹ our soft wheat contains 10 to 11 per cent., and our hard Russian wheats 15 to 17 per cent. Of hard Russian wheats there are numerous varieties which, while completely uniform in the character of translucent, almost ambery grain, vary sometimes in the colour of the ear, and sometimes in the velvetiness of the glume (outside leaflet of each grain). The most important amongst the hard wheats are the Bieloturka and Kubanka. In the south and south-west of Russia there is grown a very valuable wheat named Arnautka, unrivalled for the manufacture of macaroni, and much esteemed in Western Europe."

THE DURUM WHEAT ZONE

The chief durum wheat countries are Russia, Turkestan, Italy, and North Africa, and although these types grow in many other parts

¹ Gluten is the principal nitrogenous part of wheat. The higher the gluten-content of flour the more water will the dough absorb; consequently it yields more bread. Hard wheat produces a strong flour, rich in gluten, which makes light bread. Soft wheat produces a more attractive-looking loaf, but it is less nutritious, because it has more starch and less gluten.

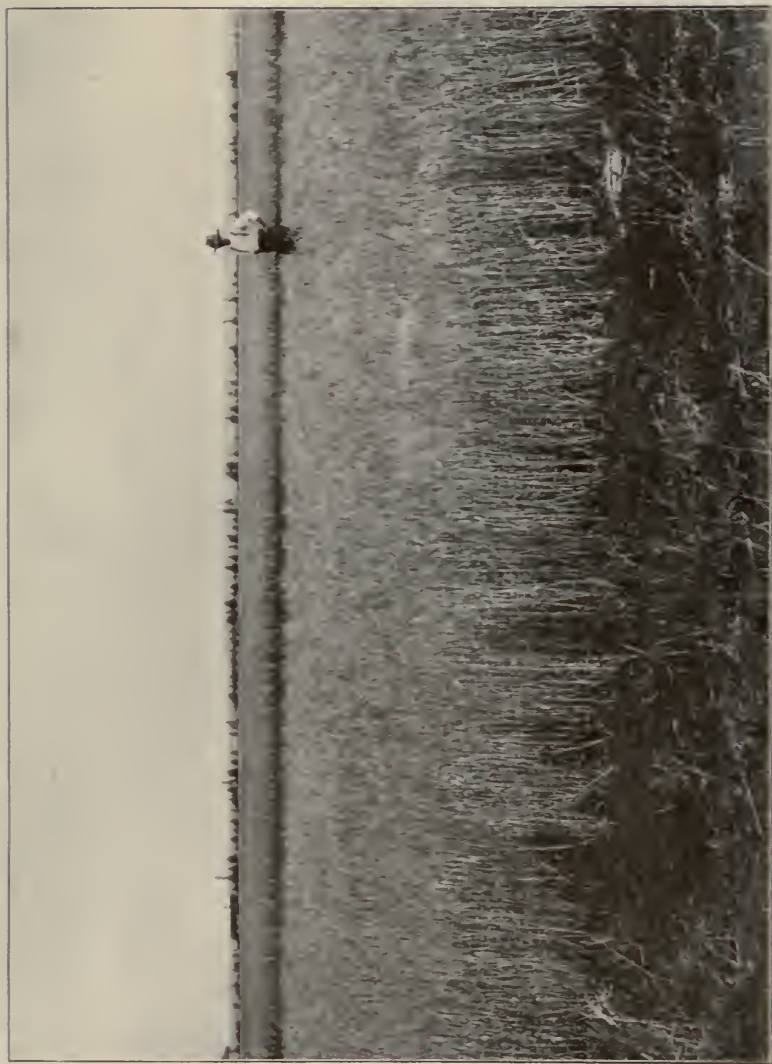
The Conquest of the Desert

of the globe, they have one striking feature in common—viz. they seem to flourish best in regions of small and irregular rainfall. The durum wheats belong to the botanical group *Triticum durum*, while the common wheats from which bread is usually made come under the heading *Triticum vulgare*.

The principal climatic features which mark out the durum wheat zone are as follows :—

- (1) The low annual rainfall, a large percentage of which falls during the growing season.
- (2) Heavy thunderstorms with but little fog or mist.
- (3) A clear, dry atmosphere.
- (4) Hot summers with great extremes of temperature.
- (5) Typical black loams. The American, Australian, and South African farmer will readily recognise that extensive portions of their respective countries fall under the above category.

Ripe durum wheat in the field looks like barley, and one is apt, on seeing it for the first time, to confuse it with the latter cereal. It is usually fairly tall, with broad, smooth leaves, the heads are heavily bearded, the kernels large and very hard, having less starch than the common types, and varying in colour from a light to a reddish-



A RAINLESS WHEAT.

The Durum Wheat—Apulia—grown on the Dry Land Station at Lichtenburg.
No rain fell on this wheat from seed-time until harvest.

A Rainless Wheat

yellow. The grain of the finest durum wheat is large, very hard, whitish, and slightly transparent. Durum wheats are grown both as spring and winter wheats. To ensure success they should be sown on moisture-saving fallows, and the growing wheat should be lightly harrowed to renew the soil-blanket and so retain the soil-moisture until harvest-time. Of the Russian varieties introduced and grown on the Government dry land station at Lichtenburg, Kubanka has given the best results during the past three years. It has since been surpassed by the rainless durum wheat Apulia, which we introduced from Italy. The word Apulia comes from the Italian Province of that name. The soil of the province of Apulia is heavy and fertile, but the whole district is deemed arid. Nevertheless, it supports a population of over two million inhabitants and produces a wide range of agricultural products. As it is probable that further inquiry may be made regarding the Apulia durum wheats, we would refer our readers to the Royal Italian Consul in London, the Marquis Faá di Bruno, who has most courteously expressed his willingness to furnish the names of the merchants from whom this particular wheat can be obtained.

The Conquest of the Desert

The durum wheats have stood the test of time. They have proved to be highly resistant to drought, heat and rust. And so we believe that by the introduction of these varieties into the Union the wheat problem has been solved. For with dry-farming and these cereals we shall be able to extend our agricultural operations to the driest districts, develop an export oversea trade, and establish thriving settlements in the waste places of Africa.

METHOD OF CULTIVATION

The method of cultivation adopted for wheat is as follows :—The virgin velt is well ploughed, varying in depth from eight to fourteen inches. A disk harrow is then used for the twofold object of pulverising the clods and stirring the soil as deeply as possible. For that purpose we use a 20-inch disk harrow, and it is pleasant to think that the finest implement of this type is made by an English firm, Messrs J. and F. Howard, of Bedford. A steel-tooth harrow is then passed over the field to form a layer of fine earth on the surface from two to three inches deep. This is the soil-mulch or earth-blanket. The land is then allowed to rest, but should it

A Rainless Wheat

begin to get hard and crack on the surface a light harrow is run over it, which prevents the escape of moisture and the drying out of the soil. Also, after every rain, the ground is harrowed, and the dry soil-blanket restored. A whole year is devoted to such soil culture, and then in the month of May the wheat is sown. It is not necessary to wait for rain, as the soil is then so moist that the seed can be sown at any time. The seed is sown with an ordinary drill, which deposits it underneath the dry soil-blanket. When the young plants are a few inches above the ground a light harrow, called a weeder, is run through them. This treatment, which was at first viewed with much surprise by the farmers of South Africa, has proved most successful. It prevents the evaporation of soil moisture, renews the soil-blanket, and restores the vitality of the crop. It may be continued until the wheat is eight to ten inches high or even more. Wheat sown in the winter-time—viz. during the month of May—is reaped in November, before the season of rust, which usually occurs in midsummer—that is to say, December, January, and February. This is, of course, a point of the utmost importance to the wheat-grower. Such was the method by which the

The Conquest of the Desert

Apulia durum wheat was produced on which no rain fell from seed-time till harvest. Side by side with the lands bearing crops are the fallow lands, ploughed and harrowed, waiting for the rain to be absorbed and held for the next planting season. Many farmers in South Africa stand idly waiting for the rains in order to plough and plant their crops. But the dry farmer, who prepares his land the year before, can plant early in the season without fear of drought or the risk of late frosts. The soil on the Lichtenburg farm is a light, shallow, sandy loam lying on a gravel subsoil. It is a poor soil for dry-farming, but it is a convincing proof of what can be done by thorough and systematic tillage.

MOISTURE BANK AND HUMUS BANK

Hardly a season passes but we hear of crops that have failed because of lack of rain, and this complaint is not confined to any particular Dominion, but is more or less common to all parts of the Empire. Search the pages of the rural magazines, consult the columns of the daily Press, and, sooner or later, your eye will light on that sombre line: "The crop has failed this year owing to drought." And the amazing thing is that no remedy is ever sug-

A Rainless Wheat

gested, no preventive is ever proposed. Decade after decade, year in and year out, drought finds the farmer unprepared, watching sadly his withering crop in a sun-scorched, waterless soil.

The Alpha and Omega in the fight against drought is the moisture-saving fallow. Without it all effort is useless. With it all soil-drought disappears. Suppose we start with the bare moisture-saving fallow and we conserve six inches of rain out of a 12-inch annual rainfall. We hold the fallow for a year and then sow our wheat in a moist seed-bed. The second season another twelve inches may fall in the field, of which, say, six inches are utilised by the plants, and so, at the end of the second year, instead of one or two possible failures, we reap a 30-bushel¹ (12-inch rainfall) crop of wheat. The establishment of a moisture savings bank to pay cash on demand is the fundamental principle in dealing successfully with recurrent seasonal droughts. This prac-

¹ Widtsoe calculates the crop-producing power of rainfall as follows :—

One acre inch of water will produce $2\frac{1}{2}$ bushels of wheat.
Ten acres inches of water will produce 25 bushels of wheat.

Twenty acres inches of water will produce 50 bushels of wheat.

The Conquest of the Desert

tice is strongly advocated by the foremost Australian authority on dry-farming, Sutton of New South Wales, who writes :

“In dry districts a proper system of fallowing is therefore an essential of success, and the general adoption of a proper system in our wheat districts is a factor which will do more than any other to remove wheat-growing from the area of speculation and place it on a sound and solid basis. With a proper system in practice, the rainfall of the previous, or a portion of the previous, year can be stored, conserved and utilised for a subsequent crop.”

And he closed an instructive address to an assemblage of farmers with these words : “Go back home and fallow till harvest-time, and, when the harvest is over, start to work the fallow and keep at it until seed-time.”

It may be said that the practice of growing crops on only half of the arable land and maintaining the other half in clean fallows means a good deal of extra labour. That is so, but it also means a certain crop in seasons of drought. It may be said that the continuous cultivation of the moisture-saving fallows will eventually burn out the vegetable matter in the soil. It

A Rainless Wheat

may be so ; but the remedy is at hand. On worn-out fallows you can always grow green legumes, fill the soil with nitrogen, and so gradually establish a humus bank. These two savings banks—the Moisture Bank and the Humus Bank—will secure the farmer against the severest drought and make possible a permanent fertility on the dry lands of South Africa.

THE YEAR OF DROUGHT

The prospect of a year of drought is the favourite topic of conversation for those lukewarm Laodiceans who, by idle criticism, vainly try to check the progress of dry-farming. Drought to the intelligent dry farmer is no more than a passing storm to the skilful mariner at sea. Before us lie two authentic records of farms where the year of drought brings no dismay. These records are taken from the admirable work on dry-farming of the most eminent American authority, Dr John H. Widtsoe of Utah. The first farm belongs to Senator Barnes of Utah, and is situated in the Salt Lake Valley. The climate is semi-arid, the summers are dry, and the evaporation large.

The Conquest of the Desert

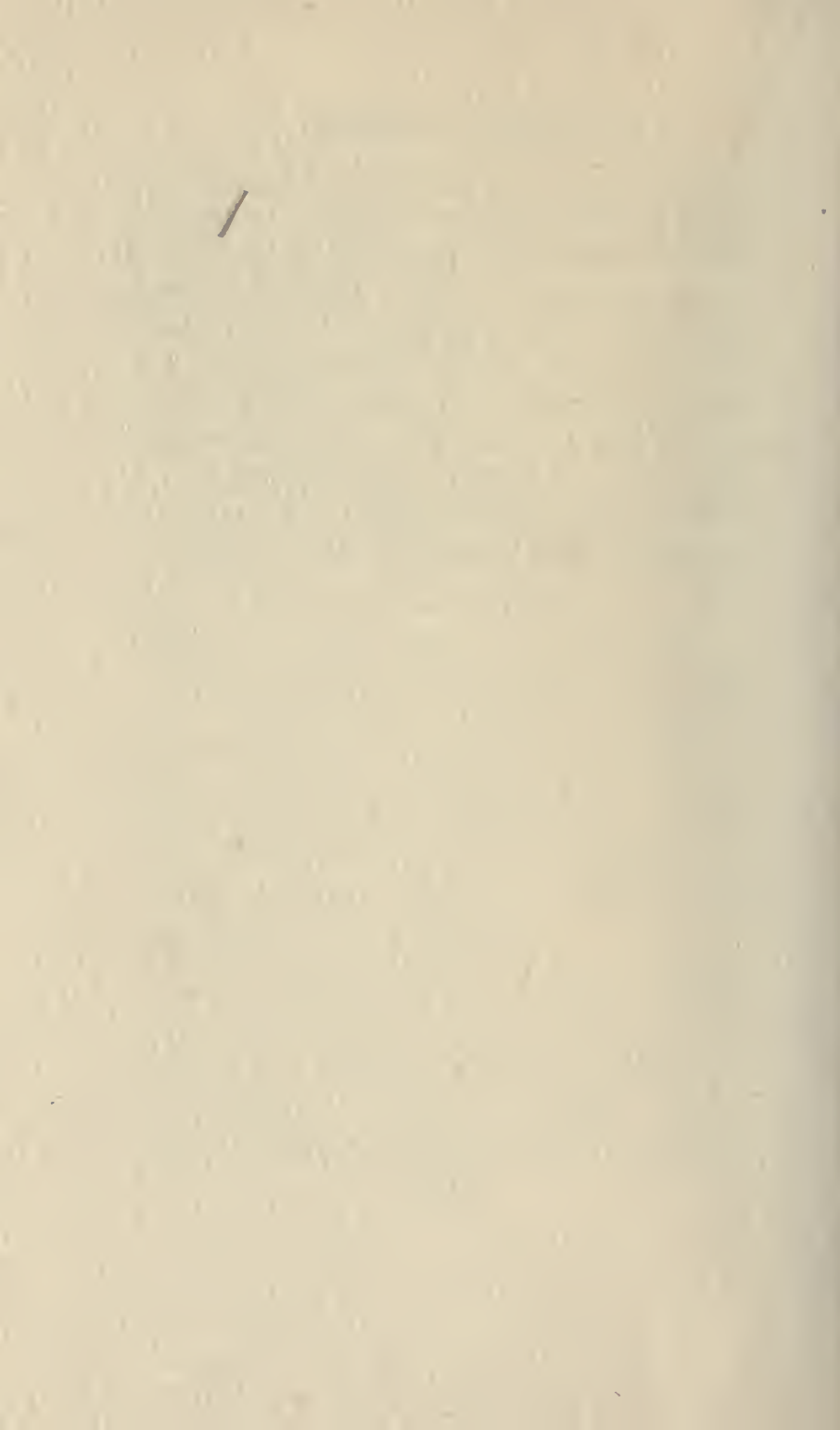
Over a period of nineteen years crop and rainfall records have been most carefully kept. There has been only one crop failure, and that was the first, when the land was not yet properly tilled. The heaviest crop of wheat, 28·9 bushels, was harvested in the year 1902, when next to the lowest rainfall occurred, which varied from 10·33 inches to 18·46 inches. Moisture-saving fallows followed every crop.

A second and equally instructive record is furnished by the Government Experimental Farm at Indian Head in Saskatchewan, Canada. Here also reliable records have been kept for the same period—viz. nineteen years. Not a single crop failure is recorded. The highest yield was forty-nine bushels to the acre, the lowest seventeen. During this period the rainfall varied from 3·9 to 20·22 inches (snowfall not included—varying from 1·3 inches to 2·3 inches of water). Here also moisture-saving fallows followed every crop.

These experiments clearly show that the year of drought need not be feared when the principles of dry-farming are properly carried out. In the conservation of soil-moisture lies the ultimate conquest of drought. And in place of the barren desert, abandoned homes,

A Rainless Wheat

and dying cattle, we can now paint a new and glowing picture. There, under a serene and cloudless sky, lies a panorama of green and chocolate-brown—mile after mile the growing wheat and the deep-stirred, water-holding fallow. No rain may fall for many a day, but the husbandman is untroubled. For he knows that his seed has fallen upon good ground, and that, from far below, those life-streams are flowing ever upward which will carry his hundredfold corn white unto the harvest.



**WHAT THE DIP MEANS TO
THE DESERT**

CHAPTER XI

WHAT THE DIP MEANS TO THE DESERT

IN describing the early days of South Africa all travellers speak with astonishment at the vast herds of game which used to roam over the velt. Now, in considering the agricultural potentialities of the country this fact should be taken into account. For it is evident that a land which formerly sustained countless herds of wild buck is likely to be equally well suited to support domestic animals. For ages the Buffalo roamed at will over the prairies of the "Far West," where at present we find the sleek Shorthorn or the placid Hereford. And so we find that the grass plains of the Free State where the graceful Springbok once gambolled undisturbed now nourish the meek-eyed merino, and pure-bred cattle from the most famous herds of the British Isles and Holland. Ten years ago the reclamation and settlement of the Desert would have seemed an almost hopeless task; because although the colonist might live there contentedly and grow farm

The Conquest of the Desert

crops with fair measure of success, the surrounding colonies lay desolate in the grip of the cattle plague. To-day the stockman of the Kalahari can face the future in a tranquil spirit. True, the farmers of Bechuanaland and other parts of South Africa have recently suffered severe losses owing to that old and still obscure disease known as "lamziekte." But there can be little doubt that it too will soon vanish before veterinary science and closer settlement.

And what does the Dip mean to the Desert? Simply this : that it will give the same security to the cattle owner on the dry lands of Western South Africa that it is now affording to the dairymen in the more humid climate of the eastern and coastal districts. It may be said that the eradication of the tick in South Africa means the disappearance of live-stock disease. But how is it possible ever to exterminate those insects, seemingly innumerable as the sands of the seashore ?

Yesterday, I stood in a little laboratory ¹ in rural England and listened to the complaint of Mr L. E. Robertson, a quiet, keen scientist " It is most vexing," he said, " that we cannot obtain any more suitable material from our

¹ The Cooper Laboratory for Economic Research, Watford.

What the Dip means to the Desert

farm in South Africa. Seven years ago it was heavily infested with the bont tick. But we have killed them all off by persistent dipping."

What a splendid complaint, and what a tribute to the union of science, industry and commercial enterprise. It is now widely acknowledged that the dry or desert lands are the best and healthiest for all kinds of live stock. And the researches in human, in plant, and in animal diseases which are now being pursued in the four Provinces and Rhodesia are all tending to ameliorate the life and improve the land of the desert dweller. But of the rich discoveries which have recently been made in Agricultural Science, none is so pregnant with hope as the cleansing dip. To recount how it came and what it means we must leave, for a little while, the red sands of the Kalahari, and take up our residence amongst the farmers of the midland and coastal regions of Natal.

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In that well-known book of successful biography, entitled "Self-Help," by Samuel Smiles, there is no more enthralling tale than the career of John Hunter, who left his carpenter's bench to become the greatest anatomist of his generation. His constant message to his students

The Conquest of the Desert

was : "Why think, Try." It is a motto which should be graven in gold in every homestead of South Africa. Again and again we hear the thoughtless statement that this crop will not grow or that sickness cannot be eradicated. But have we ever tried ? For a decade and more the sombre shadow of disease has darkened this fair land. It paralysed activity and bred in our people a nerveless fatalism. The greatest bacteriologist of the age was hurried from Berlin to Bulawayo. He came armed with test-tube, microscope and microtome. Yet he failed, save perhaps for that racy farewell message : "The disease will sweep to the sea." But at the other end of the sickness zone a plain man stood face to face with the same problem. To him it meant penury or affluence. Around him the cattle were dying in hundreds. Suddenly, on his own farm, he arrested the plague by a simple experiment. He persevered and was soon successful beyond his wildest dreams. By his practical discovery South Africa becomes at one bound the grandest cattle country in the British Empire. The conqueror of the tick by means of dipping is Joseph Baynes, of Nels Rust, Natal.

During a visit last month to this Province we

What the Dip means to the Desert

were amazed at the marvellous progress that has been made in the eradication of tick-borne diseases by dipping, and we feel sure that our readers will welcome a short review of what has been done. The story of the discovery of the value of dipping forms a fascinating chapter in the annals of South African agriculture.

In the year 1901 Mr Baynes despatched an agent to Queensland to purchase a shipload of cattle from the tick-infested areas for his dairy farm at Nels Rust. It was supposed that these cattle would prove immune to South African redwater. It was soon seen, however, that this idea was erroneous. On arrival, the Australian cattle were found to be suffering from both redwater and lung-sickness, and practically all succumbed to these diseases. Nevertheless, this unprofitable venture proved to be the most profitable speculation that Mr Baynes ever undertook, as it turned his attention to the methods of tick destruction then in vogue in Queensland. Learning that the Government of that state were eradicating the tick by means of dipping, he straightway set to work, erected a dipping tank, the first in South Africa, and prepared a dip according to the Queensland formula. In all this work Mr

The Conquest of the Desert

Baynes was ably assisted by his manager, Mr C. D. Alexander, who drew up the plan of the dipping tank and constructed a perfect model, which was later exhibited to the farmers in various parts of the country. The success of these experiments was instantaneous. Thereupon Messrs Baynes and Alexander informed the Governor of Natal, and asked him to make their results widely known to the Governments of the other South African colonies and to Rhodesia. But at that time few appreciated the magnitude of the discovery, while many freely ridiculed the possibility of stamping out tick-borne diseases by means of dipping. And so for a long time their voice was like unto one crying in a wilderness rendered desolate by disease.

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The first dip used at Nels Rust to combat redwater was the Queensland dip, but when East Coast fever broke out in Natal it became necessary to find a dip which could be used much more frequently. The Queensland dip was found to be too severe for dipping at short intervals. It was liable to burn the skin, and, indeed, sometimes killed the animal. Another objection was the time it took in making.

What the Dip means to the Desert

Thus arose the urgent need for a simple, short-interval dip. Accordingly, Baynes and Alexander began to reduce the strength of the Queensland dip, and were successfully dipping at intervals varying from seven to fourteen days. It was evident, however, that entire success would only be possible with still more frequent dipping in order to exterminate the parasites. At this moment there came on the scene a man who was destined to complete the trinity of workers, and at the same time to close the final chapter in the conquest of the tick. The name of this man is Lieutenant-Colonel Watkins-Pitchford, F.R.C.V.S., formerly Government Veterinary Bacteriologist to Natal. Watkins-Pitchford was a welcome visitor at Nels Rust, and began his observations there, which, together with his laboratory experiments at Maritzburg, three years later, gave him the key to the problem. In spite of the successful demonstrations at Nels Rust, it was then stated that as dipping could not be carried out more frequently than fourteen days, and as the engorged tick which conveyed East Coast fever dropped off an infected animal within a few days, dipping was useless to stop the disease. But Watkins-Pitchford, like John

The Conquest of the Desert

Hunter, determined not merely to think but also to experiment. He did not assume that cattle could only be dipped once a fortnight, but set to work to find out how often, without injury, they might be dipped so as to destroy all the ticks. He proposed to discover the correct composition of the dipping fluid so as to secure (1) safety in the use and (2) destructive effect. His first task was to test by practical experiment the action of all the best-known dips on the market. Finding some of them injurious, and none entirely satisfactory when used at short intervals, he evolved the now well-known laboratory dip, sometimes called the "short-interval" or "three-day dip." This dip can be used every seventy-two hours with no ill effects to the animal, and with the complete destruction of all ticks. He further showed that with frequent dipping the skin of an animal becomes temporarily impregnated with arsenic so much as to render the beast poisonous to any ticks which may become attached to it during the intervals between the successive dippings. That is to say, a newly dipped ox may destroy of its own accord a large number of ticks apart from those actually killed in the dipping tank. He proved

What the Dip means to the Desert

that the three-day dip can be successfully used for sheep and horses and other animals as well as for cattle. And, lastly, he demonstrated that the disease can be carried by man, by sheep, in hay and bedding, and that fencing alone does not prevent its spread.

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We have never had the pleasure of meeting this scientist, but no one can peruse his now classic experiments without being struck by his modesty, his industry, and his conspicuous ability. Every cattle owner throughout the Union should procure a copy of his brochure entitled "Tick Destruction and the Eradication of East Coast Fever and other South African Diseases by Dipping" (Messrs P. Davis & Sons, Maritzburg, Natal). The history of the conquest of East Coast fever in Natal affords a pleasing illustration of unselfish co-operation amongst the three workers we have just mentioned, and forcibly reminds us of these arresting words spoken by a distinguished American scholar, Dr Cyrus Northrop: "It is no longer one man thinking for himself alone that measures the progress of the race. It is rather multitudes of men thinking for humanity—all eager to share their thoughts and

The Conquest of the Desert

discoveries with one another and to publish them to the world.”

Some years ago the dairymen of the Dominion of New Zealand presented a silver salver to the inventor of the Babcock Test in recognition of his splendid services to their industry, while the members of the Legislative Assembly of Wisconsin caused his name to be inscribed on their Parliamentary rolls as the man who has made their state the most famous milk region in the great republic. But to our mind the eradication of the devastating tick is a far grander achievement than the invention of a test for butter fat. It is the custom of our Empire to honour those soldiers who have rendered conspicuous service to the nation by a vote of thanks passed in the Imperial Parliament. But peace has her victories no less renowned than war ; and we believe that the best reward which could be given to Baynes, Alexander, and Watkins-Pitchford would be a vote of thanks passed by the Union Parliament. Such public testimony would not only be a graceful tribute to the Province of Natal, but would plainly indicate that our legislators recognise the priceless service that these citizens have rendered to the Union of South Africa. Be that as it may,

What the Dip means to the Desert

we like to recall the words of the late Dr Hutcheon, set down eight years ago in the following letter, which is worthy of permanent record in the pages of this volume.

“NATAL AGRICULTURAL UNION,
“12 TIMBER STREET, PIETERMARITZBURG,
“28th *October* 1905

“The Honourable JOSEPH BAYNES, M.L.C.,
“NELS RUST.

“DEAR SIR,—I am directed by the Union to forward to you an expression of the feeling of the Inter-Colonial Agricultural Union, which met in Pietermaritzburg on Wednesday and Thursday last, regarding your successful work in dipping for the eradication of ticks.

“The Inter-Colonial Agricultural Union fully discussed the question of dipping, and at the conclusion Doctor Hutcheon, Director of Agriculture at the Cape, moved a vote of thanks to you, coupling with your name that of Mr G. D. Alexander, as being the first to introduce dipping into South Africa, on which account agriculturists owe you a deep debt of gratitude.

“The vote of thanks was carried with acclama-

The Conquest of the Desert

tion, and I have very great pleasure in forwarding this expression of the Union's feelings in the matter by this letter.

"I have the honour to be, yours faithfully,

"DUNCAN M. EADIE,

"*Secretary.*"

.
Before systematic dipping was started in Natal, had you gone through the cattle of Nels Rust, or indeed those of any other dairy farm, and examined their hair you would have seen myriads of tiny ticks so close together that it was almost impossible to touch the skin with a pin without touching a tick. Then the cattle were listless and emaciated, their hair ruffled, their ears bleeding. Then Nels Rust was one of the most horribly tick-infested spots in Natal. To-day you may wander amongst hundreds of cattle and you will find it a hard task to discover a single tick. The cattle are contented, sleek and shiny. But the important thing is that in eradicating the tick the Natal farmer has not only eliminated East Coast fever and redwater, but a host of minor diseases, such as hairball, ophthalmia, ringworm, and mange. Before dipping the annual loss of calves was enormous, often over 60 per cent. ; now it has

What the Dip means to the Desert

sunk to under 5 per cent. Let us listen to Mr Baynes on this matter : “ Before I began to dip I used to ask myself the question as I went amongst my cattle, ‘ Notwithstanding all your efforts to improve your herd and your costly importations are you making any headway ? Don’t you realise that your occupation is merely feeding ticks ? ’ And but for the hope that sooner or later I would eradicate the tick I would have abandoned farming in this country years ago.” At Nels Rust once a week all through the year every animal goes through the dip, with the exception of the merino sheep, which are dipped after clipping. Horses are dipped in the same way as the cattle. Mr Baynes continued : “ At Nels Rust all the cattle of my natives, over a thousand head, are put through the dip every week. My natives are eager to dip their cattle without any form of compulsion, because they realise that by so doing they are safeguarding them from the disease. And I see no reason why all the cattle of all the natives in the Union of South Africa should not be dipped in like manner. By tactful handling and itinerant headmen to explain matters the Government could soon persuade the natives to dip their cattle, and so

The Conquest of the Desert

the disease would be eradicated from the native territories. By the simple process of dipping, millions of pounds sterling might have been saved to South Africa."

All through the ravages of East Coast fever out of a herd of 1300 at Nels Rust only five succumbed to the disease. It is no wonder that on this farm at least they have ceased to fear tick-borne diseases. Week after week the cattle are sent out to collect the ticks. Together they go into the dip. Unhappy ticks! Can anything be more simple?

Again, where dipping has been systematically carried out the disease known as redwater has been virtually eliminated. Take a concrete example. Before adopting the practice of dipping, Mr Baynes imported thirty pedigree bulls from Great Britain at an average price of £124. All died a few weeks after arrival. Those bulls were most carefully cared for, yet in spite of daily attention they contracted the disease.

A short time ago at Nels Rust we saw two valuable Lincoln red shorthorn bulls running freely and safely on the veld. Those virulent diseases, redwater and East Coast fever, are no longer feared there, and the same is true of many other farms in Natal.

What the Dip means to the Desert

To-day, the weekly dip makes possible the safe importation from England and Europe of valuable pedigree animals. In closing this chapter it may be of interest to place on record the testimony of two prominent farmers. Mr W. J. S. Newmarch of Harden Heights stated that, in his opinion, East Coast fever had been a blessing in disguise to the stock-owners of Natal. "It has taught us," he remarked, "the lesson of keeping our animals free from ticks and vermin. The tick is to the cattle breeder what the scab insect is to the sheep breeder. Both can be easily eradicated."

Mr A. S. L. Hulett of Kearsney, the son of the founder of the tea industry, is also an enthusiastic advocate of dipping. Speaking on this subject to the author, he said :

"Formerly, on the coast of Natal it was impossible to acclimatise pure-bred stock. Imported cattle used to die within a week. Since the year 1906, when systematic weekly dipping was started, the coastal farmers have cleared their farms of ticks and their cattle have increased marvellously. In the early days even the old Zulu cattle were so eaten up with ticks that they never gave any milk, and 80 per cent. of their calves died. Now the coast

The Conquest of the Desert

farmer saves more than 95 per cent. of his calves and is busy introducing pedigree Short-horns, Ayrshires, and Frieslands. In the good old days that some people talk of, we had to live on tinned milk from Europe and butter from Australia. These were the days of imported produce. Then we fed ticks—not cattle. I shudder to think of the cruel sufferings of those poor bleeding animals in the pioneer transport period. They were literally coated with masses of ticks. East Coast fever swept the country for 200 miles from the Portuguese border to Umzimkulu. All our cattle were wiped out. We lost 400 herd.

“Nowadays, dipping with us is merely so much routine work. We dip our animals every week on Saturday afternoon and let them rest on Sunday. They are so eager to get rid of the tiniest ticks that they plunge in of their own free will. The cost is infinitesimal, and the dipping fluid lasts for about four months. Our company have recently erected six dips. Dipping is worth millions of pounds to South Africa. I am absolutely and emphatically in favour of compulsory dipping for two reasons: (1) it is humane, and (2) it is profitable.”

In the study of South African Agriculture it

What the Dip means to the Desert

is a remarkable fact that Natal has not only shown us how to eradicate the locust by means of the arsenical spray, but she has also taught us how to eradicate the tick by means of the arsenical dip, a practice which is destined to play a prominent part in the successful development of stock-farming in the uttermost parts of the desert.

THE EYE OF KURUMAN

CHAPTER XII

THE EYE OF KURUMAN

ONE hundred miles to the west of Vryburg, right in the heart of Bechuanaland, over a desolate road of limestone, dolomite and sand, lies the village of Kuruman. It is best known to fame as the mission station of Moffat and the place where Livingstone lay down on a pillow of stone and dreamt of that shining ladder which led him to Lake Ngami, to the Smoke-Sounding Falls, and to the shores of Tanganyika. Three miles down the Kuruman River you come to the old mission station, buried amidst a wealth of seringa and willow. There is the mission church built by Moffat, as sound to-day as in 1828. There is the institute for the teaching of the native children—a generous gift from the hard earnings of the good folk in the Homeland, now empty, neglected, and falling in shameful ruins. There is the twisted almond-tree, seared with the lightning stroke and seamed with decay, still bearing bravely its green fruit, where the great ex-

The Conquest of the Desert

plorer wooed and won the missionary's daughter. But the final chapter of this mission romance was closed when the weaver of Blantyre was borne into the abbey. And Livingstone must have seen a vision in the crystal pool of Kuruman when he wrote : " The world is ours. Our Father made it to be inhabited, and many shall run to and fro, and knowledge shall be increased. It will be increased more by emigration than by missionaries."

The origin of the name Kuruman is obscure. In an early book it is written Krooman. Some say it means the " place of the little calabash," others the " place of the little tortoise," and yet others that it is the name of a mighty Bushman who had his home in the cave of the weeping fountain. The " Eye " of Kuruman is a perennial stream which issues out of a dark cavern of dolomite. Its flow has been measured by the officials of the Geological Survey and Irrigation Department, and the figures given vary from four to five million gallons every twenty-four hours. So far as one can learn, it is the most remarkable spring in South Africa, and one of the purest in the whole world. When all other springs fail farmers come from afar with their flocks and herds to the Kuruman River.



(FIG. 1.)

DRY-FARMING IN BECHUANALAND.

The failure of the maize crop during the last prolonged drought was largely due to poor, shallow ploughing. In this picture the evaporation of soil moisture is enormous, because the harrow has not followed the plough.



(FIG. 2.)

A SCIENTIST WITH A RECORD "BEAT."

The breakdown of Professor Beattie at Kuruman. Professor Beattie, of the South African College, is the chief of the Magnetic Survey. His "beat" extends from Capetown to Gondokora on the Nile.

The Eye of Kuruman

Morning, noon and night, cattle, horses, sheep and goats splash contentedly in these cool, sweet waters. If Kuruman were in Canada it would be easy to forecast its rise and progress. Situated in the centre of the finest stock plains in South Africa, in the midst of a potential maize region for grain or silage, on the westward highway to the sea, in five years it would surpass Saskatoon, in fifteen Calgary, and in thirty Winnipeg. But we live in a land where men look for gold only in the mile-deep mines, and are blind to the richness of our ten-inch levels. Nevertheless, this gem of the desert is destined to have a great future.

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Our earliest record is from the pen of the Rev. John Campbell, who was sent out by the London Missionary Society on 24th June 1812, to inspect the mission stations of Cape Colony. So that here we have the testimony of a man who gazed into the eye of Kuruman over the vista of a hundred years. In his "Travels in South Africa" (p. 174) Mr Campbell writes :

"After breakfast we walked about three miles from Steven Fountain to view Krooman Fountain, whence the river of that name pro-

The Conquest of the Desert

ceeds. It is the most abundant spring of water I have ever had an opportunity to examine. I measured it at about a yard's distance from the rock whence it flows, and found it three yards wide and from fourteen to eighteen inches deep, but after a course of fifty or sixty miles it becomes invisible by running into plains of sand. Perhaps by leading it into another direction, or cutting a bed for it across the sands, it might become a more extensive blessing to the country. The last experiment is likely to be the least successful, as probably the first storm of wind would fill up the new bed. We entered the cave whence it proceeds on purpose to examine it. The entrance was narrow, but we soon reached a kind of central room, the roof of which resembled in shape, though not in height, the dome of St Paul's Cathedral in London, from which went four passages in different directions, in all of which streams flowed. Though we had lighted candles with us, we could discern no end to any of these passages. Within, the water was almost lukewarm, but outside it was very cold. The rock is composed of limestone."

Our next witness is the famous traveller, George Thompson, who visited Kuruman in

The Eye of Kuruman

1823. In his "Travels and Adventures in Southern Africa" (vol. i., p. 200) Mr Thompson writes :

" We therefore ordered the people with the waggon to make the best of their way back, while Mr Moffat and I directed our course towards the Kuruman Fountain, which we reached after a ride of about five hours. This is probably the most abundant spring of water in South Africa. A considerable river bursts at once from the rock by a number of broken passages in the side of a hill, forming a sort of cavern. Into this we penetrated about thirty feet, but without observing anything remarkable. The water as it issued from the rock felt at this time rather warm ; in summer it is said to be cold as ice. . . . I could hear nothing of the great serpent, mentioned by Lichtenstein as residing in this cavern, and which, he says, was regarded by the natives with sentiments of veneration. I doubt not, however, the truth of the report he mentions, for some species of the boa certainly exist in the country."

Further on (see pp. 18 to 23, vol. ii.) Thompson says :

The Conquest of the Desert

“ I learned from these people (Korannas) that the Kuruman River, which rises in the Bechuana country, joins the Gariep (Orange River) a little below King George’s Cataract ; but that in the lower part of its course it is often dry for years together, like the Hartebeest torrent, on the southern side.”

At that period the “ Eye ” of Kuruman flowed into the Molopo, which in turn, in wet seasons, poured its waters into the Orange River not far below “ King George’s Cataract.”

THE CATARACTS OF KING
GEORGE

CHAPTER XIII

THE CATARACTS OF KING GEORGE ¹

"Remove not the ancient landmark which thy fathers have set" (Proverbs xxii. 28).

"It seems surprising that such a wonderful work of God should be concealed from the inspection of mankind in the bosom of Wild Africa" ("Travels in South Africa," by John Campbell, 1813).

Two hundred and forty miles in a straight line from the mouth of the Orange River, and over a thousand from the leaping waters of its source in the far-off mountains of the Basutos are the Great Falls of that mighty stream. It was well said by the ancients that out of Africa there comes always something new. And so once again we have to record a story of mystery and romance. If you look at the map of north-western Cape Colony where the Orange River is bordered on the north by the district of Gordonia, and on the south by the district of Kenhart, you will see marked the Aughrabies or Great Falls. Now these falls are incorrectly

¹ Reprinted by kind permission from *The Nineteenth Century and After*, No. 439, September, 1913.

The Conquest of the Desert

named, and have been for a period of close on half-a-century. The name under which these mighty falls should be known is the name given to them by their discoverer, George Thompson, on 15th August 1824.

He called them "King George's Cataract." And Scotsmen the world over may perhaps be pardoned if they feel a thrill of pride when they remember that, as it was one of their race who first broke through the desert of the Kalahari, gazed on the Smoke-Sounding Falls of the Zambesi, and called them the "Falls of Victoria": so it was likewise, just thirty-one years before, another traveller as they believe of the same race, less eminent, but none the less brave, that pierced the desolate wastes of Namaqualand, stood by the rushing waters of the Orange River, and named them the "Cataracts of King George." At any rate there is here a fascinating field of historic and geographic research, besides the economic study of the dry and desert lands of South Africa.

In the previous chapter the reader will have noted that Thompson states that the Kuruman River joins the Gariep (Orange River) not far below King George's Cataract. My attention

The Cataracts of King George

was arrested by the animated description of Thompson's great discovery, almost as much as by the name he had selected to designate the glorious waterfall. And I determined to solve the mystery of the map, and to see for myself the Great Falls of the Great River.

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Now the extraordinary thing is that the name which was given to this waterfall by the discoverer has mysteriously disappeared from all the recent maps of South Africa. In his volume entitled "Travels and Adventures in Southern Africa," by George Thompson, dedicated to the Earl of Bathurst, Secretary of State for the Colonies, and published in 1827, we find the "King George IV. Cataract" on the author's map. This name appears also on a map published in *The Journal of the Royal Geographical Society* for 1836 to illustrate an article entitled: "On the Roads and Kloofs in the Cape Colony," by Major C. C. Michell, Royal Engineers, K.H., Surveyor-General at the Cape of Good Hope; on a map to illustrate the volume entitled "Lake Ngami, or Explorations and Discoveries," 1853, by Charles T. Anderson, and published in 1856; on a map

The Conquest of the Desert

to illustrate the "Missionary Travels and Researches of the Rev. Dr Livingstone, between the years 1849 and 1856," prepared by John Arrowsmith, 1857, and published by Mr John Murray, London, in 1875. But since that time the name King George's Cataract has disappeared, and in its place we find the word Aughrabies (Auku-rabies or rabies) or Great Falls, which is probably a Koranna name for the place or the waterfall which has since been added.

In the map attached to "Travels in the Interior of South Africa, 1849-1864," by James Chapman, F.R.G.S., and published in 1868, the name "Aukurubies" (waterfall) takes the place of "King George's Cataract." In a volume entitled "Through the Kalahari Desert," by G. H. Farini, published in 1886, a map is given in which these falls are described as "The Hundred Falls." I have consulted the volumes and maps of the early explorers in this region, such as M. le Vaillant, Burchell, Lichtenstein, Sparrman, Kolben, Campbell, Moffat, and I find, beyond all doubt, that the Great Falls on the Orange River were discovered by George Thompson and named by him "King George's Cataract"; and that the other names, both

The Cataracts of King George

native and European, were inaccurately assigned by subsequent travellers, by errors of omission or commission.

At this point we may recall the remarks of Stanley on map-makers in general, as given in "Darkest Africa," vol. ii., p. 268 :

"What the chartographers of Homer's time illustrated of geographical knowledge, succeeding chartographers effaced, and what they in their turn sketched was expunged by those who came after them. In vain explorers sweated under the burning sun and endured the fatigues and privations of arduous travel ; in vain did they endeavour to give form to their discoveries ; for in a few years the ruthless map-maker obliterated all away. Cast your eyes over these series of small maps, and witness for yourselves what this tribe has done to destroy every discovery and to render labour and knowledge vain."

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THE DIARY OF DISCOVERY

We shall now transcribe those glowing lines taken from the diary of George Thompson which

The Conquest of the Desert

tell us of the discovery of the Cataracts of King George, 15th August 1824.

“ As soon as we came to a friendly understanding with these people (Korannas), I made inquiries respecting a great cataract which I had been informed existed in this vicinity. To my high satisfaction I soon ascertained that it was not above seven or eight miles down the river ; and, as midday was scarcely passed, I determined to visit it immediately, and return to the Koranna camp to spend the night. Leaving our weakest horses, therefore, I set out with Witteboy and five of the Korannas, whom I engaged to accompany us on foot. . . . As we approached the fall, the sound began to rise upon our ears, like distant thunder. It was still, however, a work of some exertion to reach the spot, from which we were divided by a part of the river, and beyond that by a tract of wild woodland, several miles in extent. The main and middle branch of the Gariep (Orange River), which forms the cataract, traverses a sort of island of large extent, covered with rocks and thickets, and environed on all sides by streams of water. Having crossed the southern branch, which at this season is but an inconsiderable

The Cataracts of King George

creek, we continued to follow the Korannas for several miles through the dense acacia forests, while the thundering sound of the cataract increased at every step. At length we reached a ridge of rocks, and found it necessary to dismount and follow our guides on foot.

“ It seemed as if we were now entering the untrodden vestibules of one of Nature’s most sublime temples, and the untutored savages who guided us, evinced by the awe and circumspection with which they trod, that they were not altogether uninfluenced by the *genius loci*. They repeatedly requested me to keep behind, and follow them softly, for the precipices were dangerous for the feet of men, and the sight and sound of the cataract were so fearful, that they themselves regarded the place with awe, and seldom ventured to visit it. At length the whole of them halted, and desired me to do the same. One of them stepped forward to the brink of the precipice, and having looked cautiously over, beckoned me to advance. I did so, and witnessed a curious and striking scene, but it was not yet the waterfall. It was a rapid formed by almost the whole volume of the river, compressed into a narrow channel of not more

The Conquest of the Desert

than 50 yards in breadth, when it descended at an angle of nearly 45 degrees, and rushing tumultuously through a black and crooked chasm, among the rocks, of frightful depth, escaped in a torrent of foam. My swarthy guides, although this was unquestionably the first time that they had ever led a traveller to view the remarkable scenery of their country, evinced a degree of tact as Ciceroni, as well as natural feeling of the picturesque, that equally pleased and surprised me. Having forewarned me that this was not yet the waterfall, they now pioneered the way for about a mile farther along the rocks, some of them keeping near and continually cautioning me to look at my feet, as a single false step might precipitate me into the raging abyss of waters—the tumult of which seemed to shake even the solid rocks around us.

.
“ At length we halted as before, and the next moment I was led to a projecting rock, where a scene burst upon me, far surpassing my most sanguine expectations. The whole water of the river (except that which escapes by the subsidiary channel we had crossed, and by a similar one on the north side) being previously

The Cataracts of King George

confined to a bed of scarcely one hundred feet in breadth, descends at once in a magnificent cascade of fully 400 feet in height. I stood upon a cliff nearly level with the top of the fall, and directly in front of it. The beams of the evening sun fell full upon the cascade and occasioned a most splendid rainbow; while the vapoury mists arising from the broken waters, the bright green woods which hung from the surrounding cliffs, the astounding roar of the waterfall, and the tumultuous boiling and whirling of the stream below, striving to escape along its deep, dark, and narrow path, formed altogether a combination of beauty and grandeur, such as I never before witnessed. As I gazed on this stupendous scene, I felt as if in a dream.

“The sublimity of Nature drowned all apprehensions of danger; and, after a short pause, I hastily left the spot where I stood, to gain a nearer view from a cliff that more immediately impended over the foaming gulf. I had just reached this station, when I felt myself grasped all at once by four Korannas, who simultaneously seized hold of me by the arms and legs. My first impression was that they were going to hurl me over the precipice; but it was a

The Conquest of the Desert

momentary thought, and it wronged the friendly savages. They are themselves a timid race ; and they were alarmed lest my temerity should lead me into danger. They hurried me back from the brink, and then explained their motive, and asked my forgiveness. I was not ungrateful for their care, though somewhat annoyed by their officiousness.

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“I returned to my station to take a sketch of the scene, but my attempt was far too hurried, and too unworthy of its object, to please myself, or to be presented to the reader. The character of the whole of the surrounding scenery, full of rocks, caverns, and pathless woods, and the desolate aspect of the Gariepine mountains beyond, accorded well with the wild grandeur of the waterfall, and impressed me with feelings never to be effaced. . . . The river, after pouring itself out in this beautiful cascade, rushes along in a narrow chasm or canal, of about two miles in length, and nearly 500 feet in depth, apparently worn in the solid rock, in the course of ages, by the force of the current.

“In the summer season, when the river is in flood, the fall must be infinitely more magnificent ; but it is probably at that season alto-

The Cataracts of King George

gether inaccessible ; for it is evident that the mass of waters, unable to escape by this passage, then pour themselves out in mighty streams by two subsidiary channels, which were now almost dry, and at the same time overflow nearly the entire tract of forest land between them—which forms, at other seasons, a sort of island, as we now found it. I named this scene ‘King George’s Cataract,’ in honour of our gracious Sovereign.”

Naturally, it will be asked : “Did any previous traveller ever try to reach these falls on the ‘Great River’?” Yes ; two missionaries were almost within sound of the cataract, and what is more extraordinary, both turned aside without further exploration. On the 24th June 1812, the Rev. John Campbell sailed for England from the Cape of Good Hope. He was sent out by the directors of the London Missionary Society to inspect their various mission stations established throughout the colony. On 6th September 1813 he was journeying down the Great River, and writes :

“Having heard of a waterfall at no great distance, several of us set off at 9 A.M. with our

The Conquest of the Desert

guide to see it. We soon reached what might be called the metropolis of rocks, for so extensive a collection I saw nowhere else. They lay on the surface of many miles. The most conspicuous is about half-a-mile in length, and five hundred feet high. It has the appearance of an iron hill. Many low and high hills are composed of huge rocks piled above each other, and thousands of ponderous ones lie scattered over the ground in every direction, to a great distance, as if they had been transported thither by some tremendous eruption. . . . The river divides itself into several branches, which run in deep chasms, cut out of solid rock perhaps five hundred feet deep. As the sides were perpendicular, it was impossible to get down to the river. A stone thrown from the top was a long time before it reached the river. We had heard of the waterfall from various natives when we were travelling down the river, but none of them had seen it. Several had seen the mist arising from it, but the sound had so terrified them they were afraid to approach it. After a search of several hours no waterfall was either seen or heard" ("Travels in South Africa," p. 286. By John Campbell, 1815).

The Cataracts of King George

Consequently, the writer of the article in the latest edition of the *Encyclopædia Britannica* (Eleventh Edition) is in error when he states that Campbell discovered the Great Falls on the Orange River.

The second traveller, who missed by a few miles the discovery of these illusive falls, was the Rev. Robert Moffat, the eminent missionary, who entered South Africa in the year 1816, and finally left it in 1870. From Capetown he journeyed northwards to Namaqualand, where he spent over a year at the kraal of the famous robber chief Afrikaner. In September 1818, he started out on a journey to Griquatown, in the hope of finding a suitable site for a mission station. He crossed the Great River twice. How close he came to the falls is best told in his own words.¹

“The Orange River here presents the appearance of a plain, miles in breadth, entirely covered with mimosa-trees, among which the many branches of the river run, and then tumble over the precipices, raising clouds of mist, when there is any volume of water. As it was arranged that we should not start before sunset, I wandered at noon towards the river; and

¹ “Missionary Labours and Scenes in Southern Africa,” by Robert Moffat, p. 151.

The Conquest of the Desert

supposing the falls (from the noise) were not very far distant, I walked towards them ; but feeling excessively tired, I sat down under the shadow of a bush, and was soon fast asleep, having had little rest the night before. [On being awakened by his followers, Moffat, hearing the roaring of lions, left the river and directed his course to the next turn of the stream.] One of these we reached at a late hour, and it being very dark, and the banks precipitous, we heard the water murmuring below, but dared not go down, fearing a plunge, and the company of the hippopotami.”

The truth is, Moffat was a missionary before he was an explorer. Livingstone, on the other hand, was an explorer before he was a missionary. This is clearly shown by the last note in Livingstone’s diary, as he lay dying : “ Knocked up quite and remain—recover—sent to buy milch goats. We are on the banks of the Molilamo.”

.
The best recent description of the Falls is that given in *The State* (South Africa) for May and June 1911, by Mr A. D. Lewis, M.A., A.M.I.C.E., an official in the Union Irrigation Department. Mr Lewis writes : “ I have adopted the name for the falls which you will

The Cataracts of King George

find on most maps, and have spelt it as it is spelt on the map supplied with the *Encyclopædia Britannica*. [Mr Lewis refers to the Ninth Edition.] The correct pronunciation of the name is not, however, an easy matter. It probably represents the bushman equivalent for 'Great Waterfall,' and bushman words are difficult to pronounce on account of their many clicks and other strange sounds."

Mr Lewis's article is entitled "The Aughrabies or Great Falls of the Orange River," and it is hardly to be wondered at that in his ardour for the irrigation possibilities of the Orange River and far removed from historical references, he should have missed the point that the Great Falls have already been named by their discoverer. In other maps (Chapman), as we have just mentioned, the word is spelt "Aukurubies." That is to say, there is no uniformity ever in the spelling of the prefix or first syllables of this word. To saddle the majestic falls of the longest river in South Africa with such an outlandish name is unthinkable. The native name for the Victoria Falls—Mosioatunya—although equally impossible, is far more musical than the bushman word. It has been said that in all cases where a native name is available to use

The Conquest of the Desert

for any geographical feature like a river, or mountain, or falls, it should be preferred. But no geographer of any standing would dream of suggesting that the name of the English queen should be removed from the falls of the Zambesi, and few will deny an equal and earlier right for the falls of the Orange River to bear the name of an English king.

The Great Falls of the Orange River, although less majestic, are higher than the Victoria Falls on the Zambesi, and more than double those of Niagara ; and it does indeed seem strange that their correct name should be blotted out. But stranger still is the fact that these noble cataracts have remained practically a sealed book, alike to the scientific explorer and to the people of South Africa. In the space of a century a mere handful of men have visited these falls—so hard has been the approach to the southern gateway of the Great Thirst Land. But the next few years will witness a marvellous transformation in the surrounding districts of Namaqualand, Kenhart, Gordonia, and the Kalahari. For the sister sciences of dry-farming and irrigation are destined to make the desert blossom as the rose. Railways will convey the sun-seeker from Europe, along the verdant bank

The Cataracts of King George

of the Orange River, to the Cataracts of King George, and the flour mill and the elevator will bring prosperity to the poorest farmer. Here, indeed, there is scope enough for a million men, and a noble work—the conquest of the desert for the Union, the Empire, and Humanity.

THE RESTORATION OF THE RIGHTFUL NAME

“I named this scene King George’s Cataract in honour of our gracious Sovereign” (“Travels in Southern Africa,” vol. ii. p. 23. By George Thompson).

It is just eighty-nine years since these simple lines were penned, which appear as the superscription to this paragraph. I have pointed how the name given to the Great Falls on the Orange River has been mysteriously removed from all recent maps, and replaced by a barbaric bushman word. But the Great Falls of the Great River are well worthy of their true and noble title, and to-day I would ask the kind reader to stand sponsor with me while we journey westward to rechristen these mighty waters after his Imperial Majesty, while we salute the spirit of the brave explorer, and while we read the fortune of a land but newly born.

.
It was one Thursday evening in the month of March that we left Park Station, Johannesburg,

The Conquest of the Desert

by the seven forty-five train, and in the freshness of the morning were speeding over the quiet battlefields of Magersfontein and the Modder River. Soon after eight we crossed the friendly Orange, fringed with green and flow silt-laden to the sea. At eleven we reached De Aar. Do you know what that word means in the Dutch language? It is a vein of water. So when you see a long and verdant ridge in a dry and thirsty desert, you may be sure that these trees are following the flow of some underground stream, and that there you are almost certain to strike water at no great depth. The veld around De Aar is famed for fat mutton, and here the railway caterer wisely secures most of his supplies. About noon we took the branch line for Prieska. The aspect of the country was dreary and desolate, for it was still in the grip of a withering drought. But an all-wise Providence has planted the grey-green karroo bush here among the ironstone gravel, hot as fire, and those round, black, glittering rocks which seem to smile in sheer malice at the tiny grass struggling to exist in a rainless, sun-scorched land. The vital need of this region is a second Van der Stel who would compel men to plant trees to check the terrific evaporation, to

The Cataracts of King George

temper the wind, and to shade the soil from a pitiless sun. Trees—trees—trees ; the deep bore and the deep plough ; and verily you will make this part of the karroo to blossom as the rose.

Presently we passed Britstown, a pretty, tree-planted village with its thirteen windmills, and half-way a veritable oasis of lucerne lands, ostriches, and orchards at Houw Water, and in the blackness of night reached Prieska, the present terminus of the line. Prieska, which, being interpreted, means the “ Place of the Lost Goat,” is a pleasant town on the south loop of the Orange River. It is the gateway to the back country, and its future as an important farming centre is fully assured.

.
We were now ready to enter the north-west, that strange land of sunshine, deserts, and droughts, so little known to the dweller along the Reef¹ or the surf-splasher of St James.² It is a vast, alluring land of infinite silent spaces. Once you go in, you never come out. Unfold your map and let us study this “ back ” or “ up-country.” There is Kenhart. It lies one hundred and ten long miles beyond Prieska, and you may reach it by motor in seven hours,

¹ Gold-mining area of the Transvaal.

² A pleasure resort near Cape Town.

The Conquest of the Desert

by Cape cart in two days, or by donkey waggon in one week. You pass glittering mountains, to the bare and burning plains, and struggle through parched sands to follow the telegraph pole. At Kenhart we crossed the Hartebeest River, whose towering camel-trees and bright sand-dunes form a veritable pillar of cloud by day and fire by night to guide the weary traveller over seventy miles of wilderness to the banks of the mighty Orange.

It was toward evening, after four hot hours in a motor car, that we rose in huge sand-circles over the ultimate range and gazed in the soft glow of sunset on the green and fertile valley of Kakamas—one hundred and four score miles from Prieska.

At Kakamas the Orange is a majestic river, flowing swiftly between green islands. The Great Falls, to which we still were journeying, are situated twenty-four miles farther down the stream. For half of the way you are still in the settlement,¹ and constantly pass the white tents and trim cottages of the colonists. A few miles farther on we crossed the red sand of the Hartebeest River, and came to the pretty village

¹ The Kakamas Labour Colony for "Poor Whites," established by the Dutch Reformed Church (see Chapter IX., page 83).

The Cataracts of King George

of Marchand. Here we received a warm-hearted welcome from Mr Theodore Sterrenberg, warden of the irrigation furrows on Paarden Island. The rest of the road is over a switch-back country of glittering rocks and glaring river sand. It was no wonder that we were glad to rest and refresh ourselves at the lonely inn at Rhenosterkop, where we left our motor, which had borne us bravely through two hundred miles of sand and shrub and stone. Here the enterprising and patriotic manager, taking a kindly interest in our trip, stated that hereafter his winkel would be known as "King George's Hotel." From this point we travelled by Cape cart, passing a little group of Korannas who had made their home under the branches of a solitary tree, until at last we reached the farmhouse of Rooipad.

Here we slept that night, and next morning shouldered our boat and started for the falls. The boat was loaned to us through the kindness of a friend at Kakamas, who rowed it down the river as far as the village of Marchand, whence it was conveyed by ox-waggon to Rooipad. It was the first time that a boat had ever been employed to reach the Great Falls.

It now devolved upon us to carry the boat

The Conquest of the Desert

over heavy sand-dunes and through a veritable jungle of tangled thorn-trees, and then to row it across six subsidiary streams. In the midst of the swiftest current an oar broke, but, fortunately, we had one to spare. It was in an exhausted condition that we gained the main island. Here we were heartened by the arrival of Mr Nel, the farmer at Rooipad, who had kindly left his goats to act as our guide.

We marched rapidly forward. It was blazing hot. We left the grateful shade of the trees and tramped over the burning granite rocks. We had toiled since sunrise. It was now noon. At last we came in sight of the dark cañon. Nel, far in advance, waved his hand. The roar of the fall grew louder and louder, and we pressed eagerly forward. A long range of mountains rose in a great semicircle and faded to the German border; straight up the river was a forest of sun-splashed green, but all around us was bare and barren rock. At length we gained a ledge, high above the roaring river, and gazed in wonder on the Cataracts of King George.

Away above was the main stream of the mighty river, which, suddenly dividing, swept into two narrow channels, while the plunging, prisoned waters, fighting to be free, fell headlong

The Cataracts of King George

into the dark abyss below. Every few minutes a vast column of vapour rose from the river and spread far and wide in a soft white mist. The water of the Orange is chocolate-coloured from carrying fine particles of silt, and you might almost imagine that a million men were shovelling soil into the river, every single second, where the cataracts leap into the cañon.

With the life-giving juice of a lemon we solemnly re-christened the Aughrabies, or Great Falls of the Orange River, as the Cataracts of King George. And then, having taken a few photographs, we prepared to return. Except in the middle of winter, when the tributary streams are low, it is not possible to reach the Great Falls without a boat save by swimming. This method was adopted by two members of our party, the Hon. Paul Methuen and Mr Gustave Lutz of Upington, Gordonia.

.
And now in the quiet comfort of my home I would like to record a few reflections. The Union Government owns a large tract of land on both sides of the waterfall. All citizens of South Africa will pray that this splendid heritage may be preserved for all time to come and be laid out as a National Park, as has been done at

The Conquest of the Desert

Niagara by the Governments of the Dominion and the United States. With a few light suspension bridges these wonderful cataracts could be made easily accessible to all tourists ; while with the stupendous power of the falls we may hope to see at no distant date the development of a vast system of irrigation works and agricultural industries, and the establishment of an electric railway, running from the cataracts to Kakamas, and thence via Upington to connect with the main line at Prieska.

In closing the sketch of our tour, let us turn for a moment to the pages of William Paterson and listen to his account of the baptism of the Orange River. On 17th August 1779, the brave traveller, Colonel Gordon, with his daring little band—Jacobus Van Reenen, Pienaar, and Paterson—reached the Great River . . . “ which appeared at once to be a new creation to us, after having passed nine days in crossing an arid and sultry desert, where no living animal was to be seen and during which our cattle had but twice tasted the luxury of a drop of water. . . . In the evening we launched Colonel Gordon’s boat, and hoisted the Dutch colours. Colonel Gordon proposed first to drink the State’s health, and then that of the Prince of

The Cataracts of King George

Orange, after which he gave the river the name of the Orange River, in honour of that Prince.”

It has been well said by an immortal writer :
“ That man is little to be envied whose patriotism would not gain force upon the plains of Marathon or whose piety would not grow warmer among the ruins of Iona.” And so, in this day of indissoluble Union, there are surely few of us who can gaze unmoved on the map of Southern Africa when we remember that the Great River ¹ was called after a Dutch Prince, and that the Great Falls again rightly bear the name of an English King.²

¹ In old works of travel the Orange River is termed the Gariep or “ Great River.”

² On my return to the Transvaal I forwarded a summary of the above investigations to Dr J. G. Bartholomew, and in a courteous letter of acknowledgment the eminent geographer states that upon receipt of this information he gave instructions that on the new maps of South Africa to be issued by his firm, the Great Falls of the Orange River shall hereafter be described by their true and former name.

THE LIFE DREAM OF
LIVINGSTONE

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CHAPTER XIV

THE LIFE DREAM OF LIVINGSTONE

"The end of the Geographical Feat is only the beginning of the Enterprise."

"I beg to direct your attention to Africa. I know that in a few years I shall be cut off in that country which is now open. Do not let it be shut again. I go back to Africa to try to make an open path for commerce and Christianity. Do you carry out the work which I have begun. *I leave it with you.*"—DAVID LIVINGSTONE.

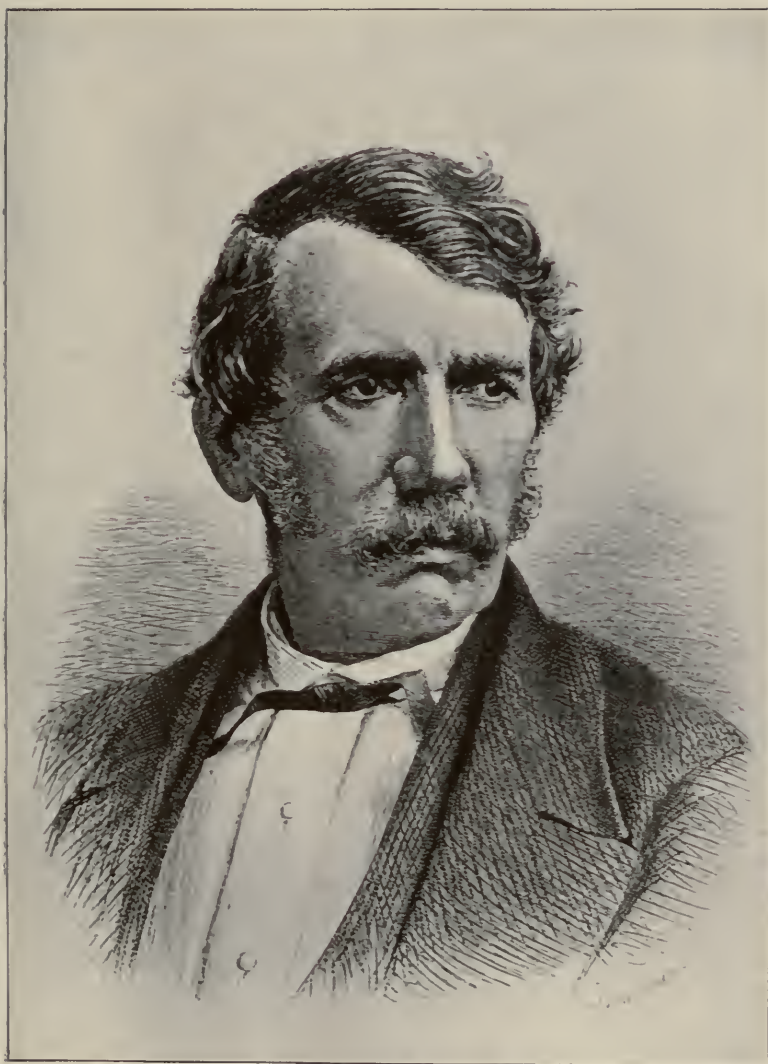
IF you climb up from the gloom of the Waverley Station, in the city of Edinburgh, and pass out into the sunshine along the grandest street in all the world, you come suddenly on a scene of matchless beauty. High above is the grim old castle, down below the gleaming street, in between the dewy gardens where the mavis still is singing his love song to the morn. One packed mile of Scotland—flowing traffic, fairest women, and four furlongs of those statues to her splendid sons in the foremost files of time.

There it is! A simple monument to the great explorer, with Bible, axe, and lion-skin. Heroic: well worthy of Carlyle. Certainly the bravest-hearted emigrant that ever left

The Conquest of the Desert

the British Isles; the finest soul that has lived and died for Africa. Other writers have dealt with the missionary labours and epoch-making discoveries of David Livingstone, but none has so far shown that the dream of this fearless traveller was not so much the conversion of the savage, nor yet the search for the fountains of the Nile, nor even the destruction of the slave trade, but rather that these vast startled solitudes should become the highways of a benign civilisation and the happy homes of industrious colonists.

.
The father of David Livingstone was a small tea-dealer, who died in the year 1856, while his illustrious son was travelling homewards from Zumbo on the Zambesi. Of his mother his earliest recollection was an anxious housewife striving to make both ends meet. Yet on their tombstone in the cemetery of Hamilton he thanked God "for Poor and Pious Parents." In South Africa we are accustomed to hear that crude and heartless doctrine that a welcome should be extended only to those immigrants in possession of £1000. It is indeed a pleasant theory for the light weights of land settlement, but so far as common-sense and Scottish emigra-



DAVID LIVINGSTONE—1813-1873.

The Life Dream of Livingstone

tion are concerned not worth a crooked bawbee. To the very last Livingstone was proud of the class from which he had sprung. When the highest in the land were showering their congratulations on the great explorer, he was busy writing to his old friends of "my own order, the honest poor," and trying to promote their welfare by schemes of colonisation.

The child in the cotton factory and his quenchless thirst for learning are best told in his own words :

"At the age of ten I went to the factory as a piecer. With a part of my first week's wages I purchased Ruddiman's 'Rudiments of Latin,' and studied that language for many years with unabated ardour, or at an evening school, which met between the hours of eight and ten. I continued my labours when I got home till twelve o'clock, or later, if my mother did not interfere by snatching the books out of my hands. I had to be back in the factory by six in the morning, and my work lasted, with intervals for breakfast and dinner, till eight o'clock at night. I read in this way many of the classical authors, and knew Virgil and Horace better at sixteen than I do now."

The Conquest of the Desert

Further on he writes :

“ My reading in the factory was carried on by placing the book on a portion of the spinning jenny, so that I could catch sentence after sentence as I passed at my work. I thus kept up a pretty constant study undisturbed by the roar of the machinery. To this part of my education I owe my power of completely abstracting my mind from surrounding noises, so as to read and write with perfect comfort amidst the play of children or the dancing and songs of savages. ”

.
Having qualified in due course as a medical missionary, Dr Livingstone embarked for Africa in the year 1840, and after a voyage of three months reached the Cape. From thence he proceeded to Algoa Bay and a little later trekked inland to the Kuruman mission station in Bechuanaland. Having rested his oxen he next turned his attention to the north. The chief of the Bakwains was Sechele, who lived at a place called Shokuane. When Livingstone stated his determination to go north, Sechele pointed to the great Kalahari Desert and replied : “ You can never cross that country to the tribes beyond.



(FIG. 1.)

MOFFAT'S HOUSE AT KURUMAN.

The residence of Robert Moffat, the eminent missionary, and of his distinguished son-in-law, Dr. Livingstone, the greatest explorer of modern times.



(FIG. 2.)

MISSION INSTITUTE AT KURUMAN.

These beautiful buildings, erected at a cost of ten thousand pounds, are falling in shameful ruins.

The Life Dream of Livingstone

It is utterly impossible even for us black men, except in certain seasons, when more than the usual supply of rain falls, and an extraordinary growth of water-melons follows."

We have no space to speak of Livingstone's explorations in the "Great Thirst Land"; but the following note written so long ago must be of interest to us :—

"The whole of the country adjacent to the desert, from Kuruman to Kolobeng, Litubaruba and beyond, up to the latitude of Lake Ngami, is remarkable for the salubrity of its climate. Europeans whose constitutions have been impaired by an Indian residence, feel its restorative powers. Mr Oswell thought the climate much superior to that of Peru, and were it not for the great expense of such a trip, I should have no hesitation in recommending the borders of the Kalahari Desert as admirably suited for pulmonary complaints. It is the complete antipodes of our raw English atmosphere. The winter, which begins in May and ends in August, is perfectly dry. Not a drop of rain falls during that period, and damp and cold are never combined. During many months there is scarcely any dew. However hot the day might have

The Conquest of the Desert

been at Kolobeng—and the thermometer sometimes rose to ninety-six degrees in the coolest part of our house—yet the atmosphere never had that steamy feeling and those debilitating effects which prevail in India and on the coast of Africa itself. Nothing can exceed the balminess of the evenings and mornings throughout the year. You wish for an increase neither of cold nor heat.”

Take up an old map of the Springbok Flats and you will still see the words “barren, waterless desert.” But the deep bore and the principles of dry-farming have turned those arid wastes into the richest arable lands in the Transvaal. So it shall be with the “Great Thirst Land !” Livingstone writes :

“The space from the Orange River in the south, lat. 29, to Lake Ngami, in the north, and from about 24 east long. to near the west coast, has been called a desert because, though intersected by the bed of ancient rivers, it contains no running water, and very little in wells. Far from being destitute of vegetation, it is covered with grass and creeping plants ; and there are large patches of bushes and even trees. In

The Life Dream of Livingstone

general the soil is light-coloured soft sand, nearly pure silica. The beds of the former streams contain much alluvial soil, which being baked hard by the burning sun, rain-water in some places stands in pools for several months of the year. . . . The quantity of grass which grows in this region is astonishing, even to those who are familiar with India."

From Kuruman Livingstone started on his memorable journeys to Lake Ngami, the Zambesi, Loanda and Quilimane.

Like all Scotsmen, Livingstone was firmly convinced of the great value of emigration to the individual as well as to the Empire at large ; and to plant British colonies in Africa became one of his master ideas and favourite schemes. In one of his letters he advises his own family to emigrate. He sent home ten pounds to aid this scheme of emigration, and ten pounds to be spent on clothes for himself. A little later we find that he wishes to add the second sum to the first, so that his help might be more substantial ; and he would make his old clothes serve for another year. The emigration scheme which he thought would have promoted the welfare of his parents and sister was not, however, carried into effect.

The Conquest of the Desert

From the very first Livingstone saw the importance of the Shire Valley and Lake Nyassa as the key to Central Africa : and he was prepared to spend a great part of his private means to aid in settling this region. On the 4th of August 1859, he writes in his journal : " I have a very strong desire to commence a system of colonisation of the honest poor ; I would give £2000 or £3000 for the purpose." Livingstone longed to develop by means of an industrious peasantry those regions which he had discovered. He died without being able to put his ideas into practice. Surely we in South Africa with our vast wealth, in peace and comfort, might spare a little to carry forward his life dream !

In his book on "Livingstone and Central Africa," Sir Harry Johnston, in speaking of the spot where the explorer's heart lies buried, says that in the gold rush of the future on the shores of Lake Bangweolo, the local inhabitants will probably be too busy or too mean to spend their money on monuments to his memory.

We do not believe this to be true of South Africans. But is there a solitary statue to the immortal traveller in the whole of the Union ? And if not : why not in Pretoria ?

Livingstone belongs to the whole nation. To

The Life Dream of Livingstone

the Dutchman he must ever appeal as the grandest Voortrekker that has been ; while the Englishman can never forget that those lion-mangled bones were fitly laid to rest, amid the pomp of a mourning Empire, in the peace of the hallowed Abbey. The last time I crossed the American Continent I stood before a splendid monument in the main square of Salt Lake City. On it was inscribed the thrilling line :

TO BRIGHAM YOUNG

AND

THE PIONEERS

How much nobler was the life-work of our African hero ! Why should not we write on our statue :

TO DAVID LIVINGSTONE

AND

THE VOORTREKKERS

He must look towards the Great North. And on Transvaal granite should be carved in Transvaal gold his prophetic words : " The End of the Geographical Feat is only the Beginning of the Enterprise."

It is thirty-nine years since the great traveller passed away in the lonely rondavel at Ilala.

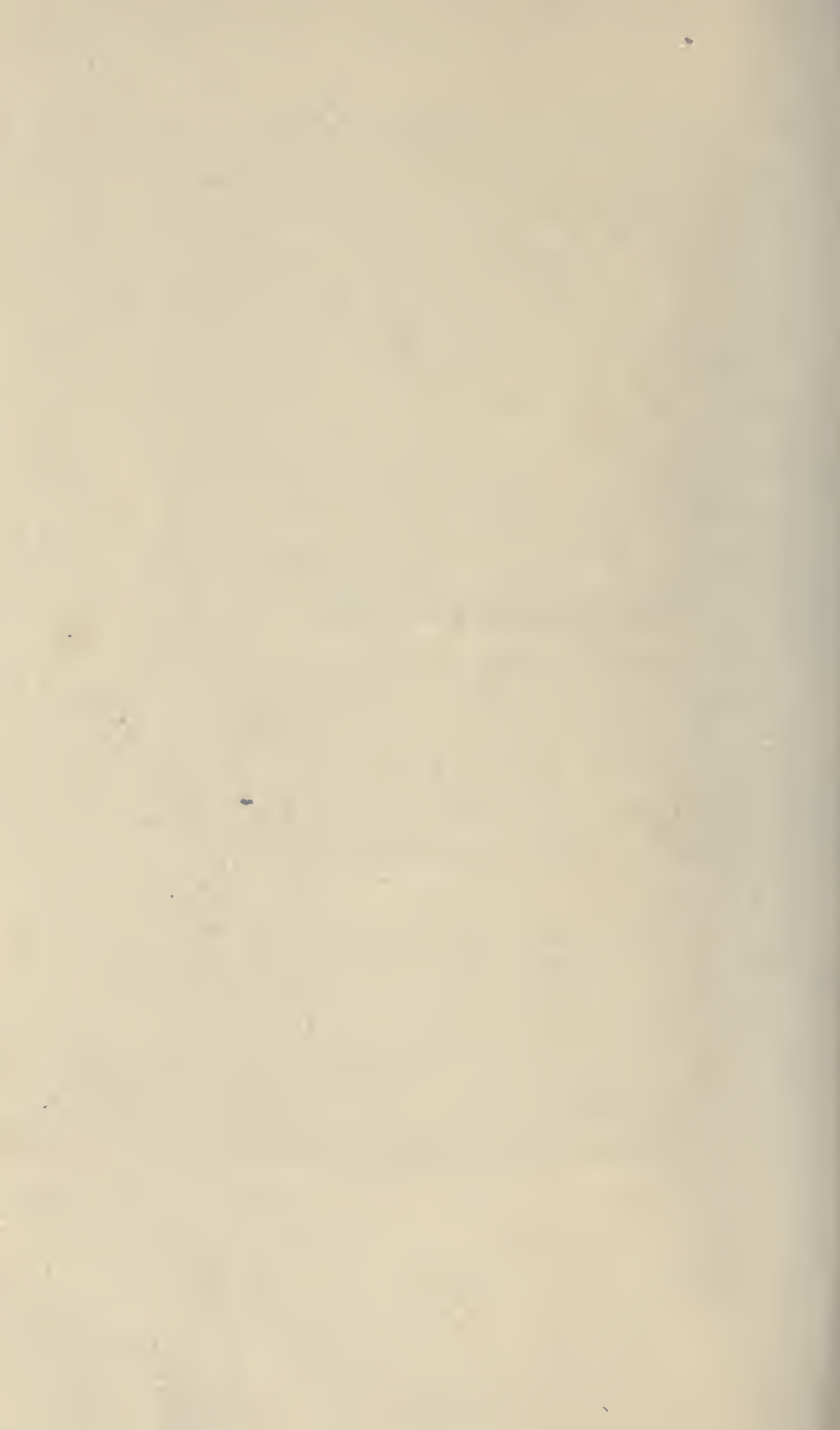
The Conquest of the Desert

Since then we, on the African Continent, have made marked progress in civilisation, but how feeble have been our efforts at colonisation ! Down here in the south we hold a vast empty land, sunlit and healthy ; while both here and beyond the sea there are multitudes of men—the honest poor—only waiting for a welcome and a chance to subdue our deserts and make them blossom as the rose. And they will not bring poverty : nay, rather, untold wealth to our Union. An American statesman, the late Mr Blaine, used to value every penniless British emigrant at three hundred pounds to the United States. The cotton-spinner was poor. He had no capital, but he carried the richest civilisation through the pathless jungles of the Dark Continent, and in the solitude of primeval forests saw the flash of the ether wave, and heard the tramp of a million men. And of him a poet wrote :

“ Open the Abbey doors and bear him in
To sleep with King and Statesman, Chief and Sage,
The missionary come of weaver-kin,
But great by work that brooks no lower wage !

“ He needs no epitaph to guard a name
Which men shall prize while worthy work is known !
He died and lived for good—be that his fame !
Let marble crumble : this is Livingstone.”

THE EMPTY LAND



CHAPTER XV

THE EMPTY LAND

“ But how can that Land be cultivated when there is nobody to cultivate it.”

“ A dense population, a high development of industry, and a high development of agriculture and horticulture, go hand in hand ; they are inseparable.”—PRINCE KROPOTKIN.

IN the previous chapters I have dealt with the most thinly peopled part of the Union—namely, the southern portion of the Kalahari Desert, and the surrounding region. And so in this closing chapter it may be of interest to speak briefly of the more highly civilised or thickly settled Provinces. But whether we traverse the great karroo, the wind-swept plains of the Free State, the bush veld or the low country, it is all the same—we see a vast empty land, rich beyond the dreams of fancy, waiting only for the sturdy colonist to build his home, to subdue the earth, and to make the wilderness and the solitary place rejoice.

¹ The Union of South Africa comprises the

¹ An address delivered at a meeting of the Royal Colonial Institute on 21st April 1913, Sir Harry Wilson, K.C.M.G., presiding.

The Conquest of the Desert

four provinces of the Cape, the Transvaal, the Free State and Natal with Zululand. It has an area of 473,954 square miles, and is therefore more than nine times the size of England.

The population of this vast country, according to the latest census, is only 1,276,242 whites, and 4,697,152 coloured people. Broadly speaking, we may think of South Africa as a narrow coastal region fringing a vast inland plateau which rises in a series of terraces successively pierced by the brave path-finders, as they trekked ever onward and ever upward till they won the topmost ridge of all where the white waters leap forth to flow to the opposite seas, and the gleaming gold revealed the grandest Eldorado the world has seen.

A study of statistics discloses several interesting lights in connection with the agricultural industry of South Africa. For example we note that while the total produce of the mines in the year 1912 was £49,394,640, the total produce from the land was only £11,163,506. It is significant, however, that the produce from the land has doubled within the past five years. And there is no doubt that it is only a question of time when the output of agricultural produce will surpass, as all desire, the output from the



(FIG. 1.)

SOIL EXAMINATION.

The Dry-Farmer should dig a hole ten feet deep at several points of his farm. The best soil for holding moisture is a deep, rich loam of uniform texture: the worst is shallow and gravelly, or land broken by layers of different soil strata. In the illustration the farmer has found limestone underneath the black surface turf.



(FIG. 2.)

SELECTING THE SITE OF A DRY-LAND EXPERIMENT STATION.

Note the Mimosa Tree—a sign of good, deep soil.

The Empty Land

mines. Meanwhile, the best sign of rural progress is the rise in the price of farm land, which in many parts throughout the Union within the past few years has doubled or even trebled in value. Among the causes of this rise is the extraordinary success of dry-farming. Dry land, which a short time ago was utterly useless, is now producing excellent crops, and this mode of farming is the cheapest in the world.

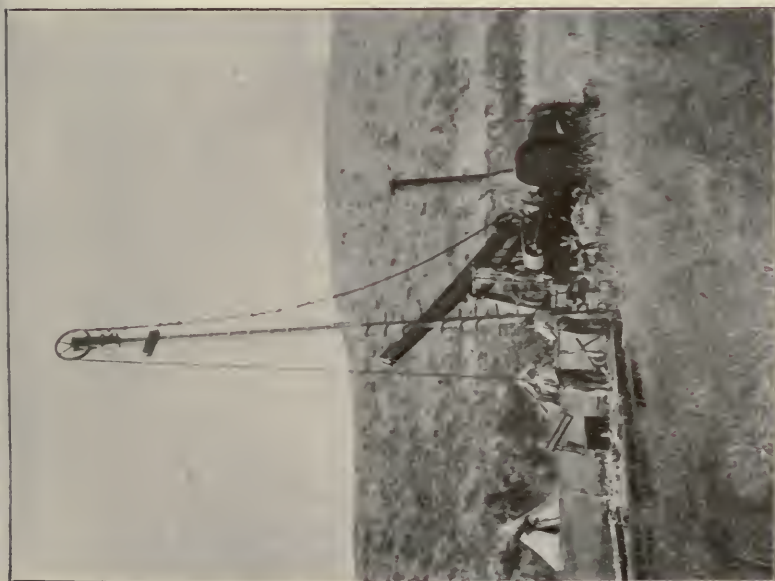
The first thing that strikes the stranger in South Africa is the diversity of its climate. For example, the rainfall throughout the Union may vary in a single season from one inch per annum at Walfish Bay and in Namaqualand, to one hundred inches on the Wood Bush Mountains, North-Eastern Transvaal, and Table Mountain, Cape Town. Moreover, the high veld of the Transvaal may be bitter cold in the winter-time, while the temperature of the coastal regions of Natal, during the summer months, is, as you know, often tropical. Now this wide range of climate renders possible a wide range of crops. In no other country of the world—not even in the United States of America—do you find the same amazing wealth of agricultural products — from oranges to ostriches, from tea to angora goats, from maize

The Conquest of the Desert

to merino sheep, from wine to wattles, and from sisal hemp to sugar-cane. To recognise these different zones is most important. And it is here that costly mistakes have been made in the past. Much money has been wasted in trying to grow crops in districts for which they were not suited. And so to the prospective settler arises the pertinent question: "*What shall I farm?*"—for the crop I desire to grow must determine the province or district in which I shall reside."

.

And now as to State aid. Some time ago the Prime Minister of New Zealand stated that his Dominion spent on agriculture more per head of population than any other country—namely, three shillings. I deemed it my duty to point out politely that the Union, which is spending per head of the European population eleven shillings, is entitled to the premier place. The aid given by the Government to the farmer may be summed up under three heads: (1) *The Department of Agriculture*, (2) *The Land Bank*, and (3) *The Land Settlement Act of 1912*. The Union Department of Agriculture, by means of a large staff, with its headquarters in Pretoria, and branches in each of the several provinces,



(FIG. 2.)

BORING FOR WATER.

The Deep Bore enables the Dry-farmer to obtain water for domestic purposes and for his animals. The deepest Government bore in South Africa is 1,800 feet. The Author believes that the Kalahari Desert is underlaid with water, which can be utilised by boring.



(FIG. 1.)

A FAMOUS DRY-FARMING REGION.

Showing the heavy clay soil of the Springbok Flats.

The Empty Land

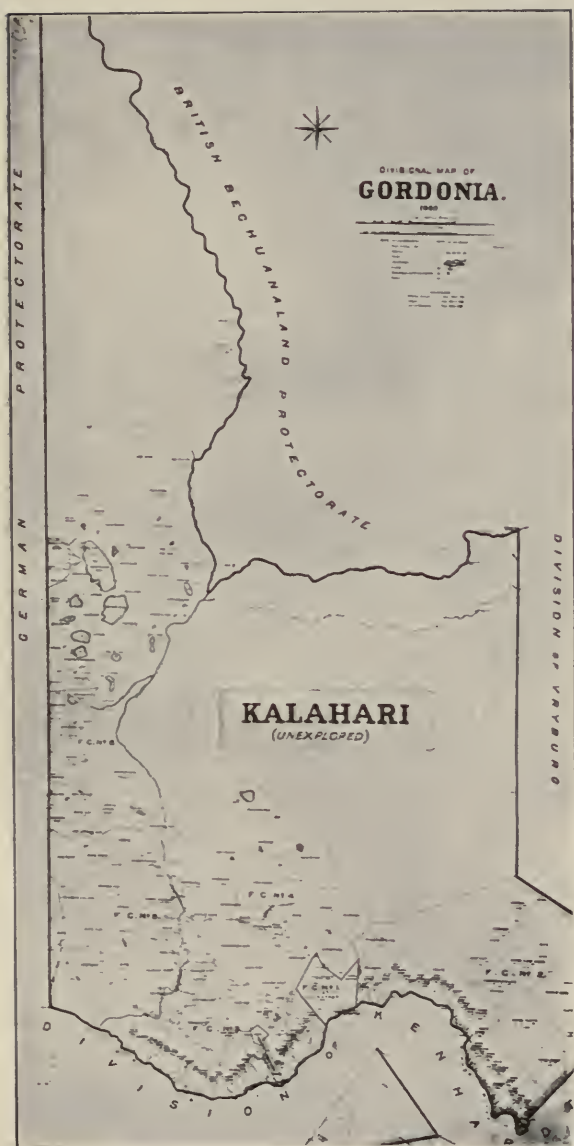
covers practically the whole field of rural activity. The success of the Department is mainly due to the organising power, and patient, unwearied effort of Mr F. B. Smith, the Secretary for Agriculture. The Union Land Bank has been established for the purpose of aiding deserving farmers in the development of their farms. Its present capital is £6,000,000 and the loans vary from £50 to £2000. Advances are made on improvements, on the purchase of live stock, on promotion of rural industries, and on the purchase of land. Special provision besides is made for advances to settlers up to the sum of £500 in order to supply them with stock, implements, and seed necessary to develop their holdings. During the last session of Parliament a Land Settlement Act was passed which is destined to have a profound influence on the future of the country. By this Act the Minister of Lands is given large powers over any money voted by Parliament for closer settlement. He may purchase land by auction, or by private treaty, or he may exchange existing Crown land for private land; the conditions required for a Government holding are not onerous, but they assume a certain amount of capital on the part of the colonist. Lastly,

The Conquest of the Desert

under this Act the Minister may offer holdings to applicants from oversea through the High Commissioner in London.

None will deny that here at least is a vast empty land. But it is often said that South Africa is not ripe for settlement. It is not so. Every farmer knows that the maladies which attack his crops and his herds can best be checked and conquered by the wire fence of Closer Settlement, the cleansing dip, and the poison spray. But, again, it is often said that South Africa is a hard country in which to farm in comparison with other lands. It is not so. For who that knows Western America, from practical experience, will deny that farming on the American prairie is a harder task than farming on the veld? And so, in this final chapter, I would appeal to our own people—the British race—to come to South Africa.

At the same time let us not forget that although mainly colonised by the Dutch and the English peoples, South Africa has been enriched by the blood streams of other European settlers from the French Huguenot to the modern German—all of whom the Southern Mother is slowly moulding in the mills of her Imperial destiny.



SHOWING THE STEADY ADVANCE OF SETTLERS ON THE DESERT.

The Empty Land

A short while ago among a small party I stood on a high hill overlooking that wonderful city of industrial enterprise—Johannesburg. We were met to see a tract of land which was about to be laid out in Freehold Allotments for a thousand white workers of the City Deep Mine. And as we viewed the picturesque and healthful site, Earl Grey turned to the patriotic capitalist,¹ who first in the Transvaal was planning here a Garden City, and remarked: "I envy you this magnificent work of development." Lord Grey's words seemed to carry the promise of a new era, and the hope of a commonweal of industry, trade, and agriculture. For what in life can be a grander work than to create free homes for men and women, and to hear the laughter of their happy children, on the garden lot, the small holding, or the thousand-acre farm amid the everlasting sunshine of what is yet an empty land.

¹ Mr R. W. Schumacher.

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